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438A Folder / 438B Feeder V4 Service Manual

ISSUE 2008/05

071-28558-401 (A)

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USING THE MANUAL

1. TABLE OF CONTENTS

Each capitalized alphabetic character represents a major division within the manual (Section A).
Under each major division, the capital letter is followed by a number. This represents a subdivision of the major section (Section A1. is a subdivision of A.).
Under each subdivision, an alphanumeric combination is followed by a decimal and a lower case letter. This represents a smaller division under a subdivision (Section A.1a. is a subdivision of A.1, Section A.1a1 is a subsection of A.1a).
Each major section of the manual begins with page 1 and is numbered in sequence through that section only. Section A begins with page 1, section B begins with page 1, etc. This manual is divided into Section A through I. A detailed table of contents is located on the first page of each section.

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2. HEADERS / FOOTERS

The information listed along the left edge refers to the machine, the manual type, and the part number and revision level for that manual

The particular issue listed in the center is an internal tracking device.

The top line of information along the right side states the title of the particular section. The bottom line lists the section and the page number within that section.

3. LIST OF CHANGES IN THIS REVISION

ECN: 9606
Issue Date: 3/5/2008
Revision: This is a first release for the 438A V4 Service Manual
Software supported by this revision: XXX-XXXXX-XXX

Changes incorporated in this manual:

Section	**Change**
New Release	

4. SECTION ISSUE DATES

Sect A XXXX/08

Sect B XXXX/08

Sect C XXXX/08

Sect D XXXX/08

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A.1 RELATED MANUALS

The following manuals are available for the 438.

- 071-28855-402 438A & 438B PARTS MANUAL

A.2 INTRODUCTION TO THE MANUAL

This manual is intended for service technicians and is organized to enhance preventive maintenance, troubleshooting, and repair of the 438. Installation of the 438 is also described.

Note: The exact screens and functionality are software version dependent. Specific features may be available or not, or have default settings according to the software version.

A.3 INTRODUCTION TO THE MACHINE

A.3a Feeder Section

The 438's feeder is bottom fed, top loading for continuous operation, with a capacity of 1500 sheets (20 lb bond or offset paper).

Creeper Conveyor

The Creeper Conveyor is comprised of two black rubber belts driven by a motor located on the bottom side of the hopper. Controlled by a paper level detector, the motor is activated when the detector indicates that paper is low.

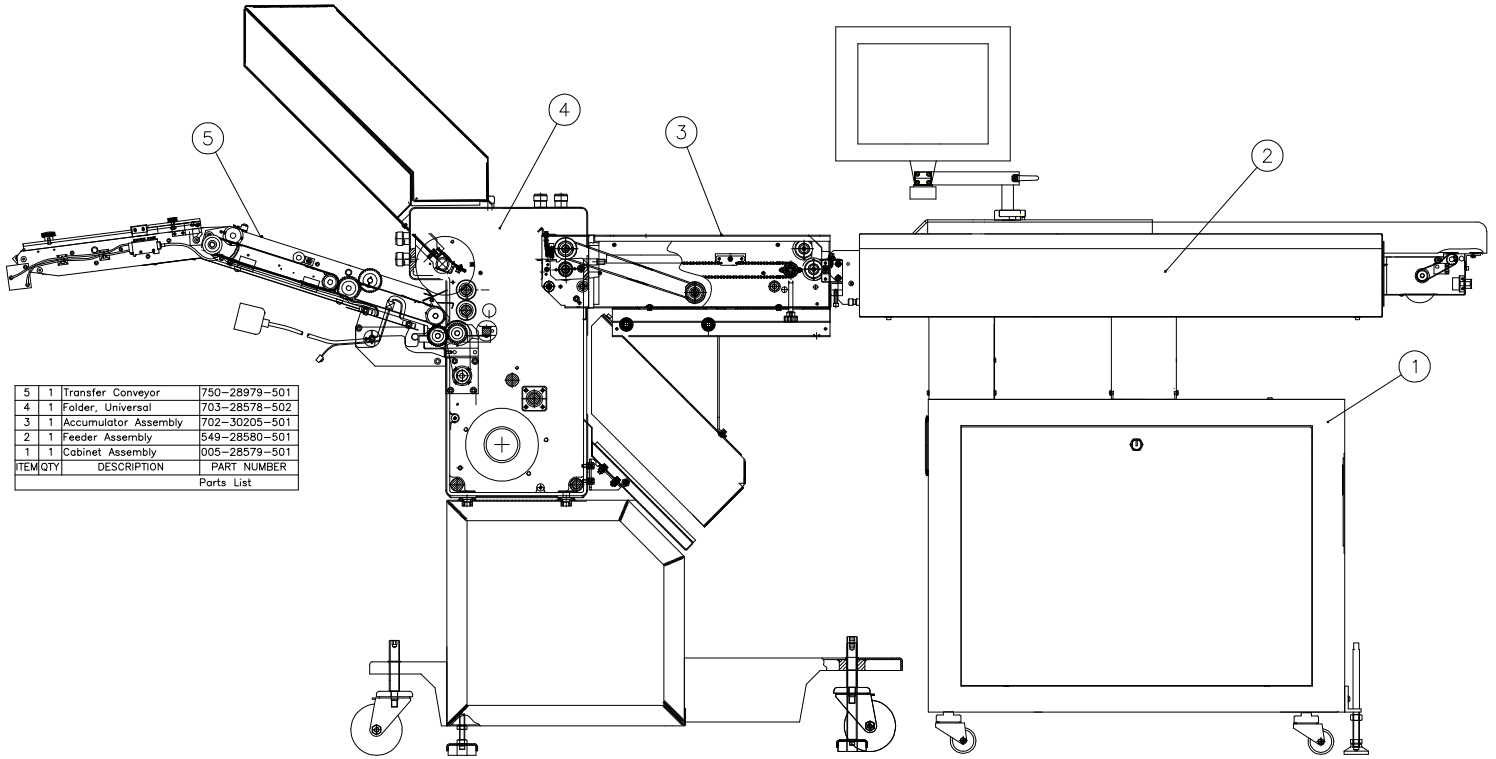
Hopper and Feeder Paper Guide Rails:

The two stainless steel rails mounted on the hopper are adjustable via a locking handle at the rear. At the front they interlock with the feeder side rails, then lock to shafts running across the machine. Both sets of rails should be adjusted together.

Paper Hopper

The Paper Hopper supplies the bottom fed friction feeder continuously while the operator loads paper from the top. It has 4 mounts (2 each side, with set screws) in which the hopper slides. The Hopper Table is located behind the feeder. Paper level in the hopper is controlled by a demand switch. The position of the hopper table determines how well the demand switch will perform this function. During normal operation a metal wand rests on the incoming paper. As more paper is needed, the metal wand will fall low enough to close the demand switch. This activates the creeper conveyor motor to drive the hopper belts, conveying paper into the feeder area under the paper level detector. When the proper level of paper is attained the wand will have been lifted enough to open the switch, shutting off the creeper conveyor motor.

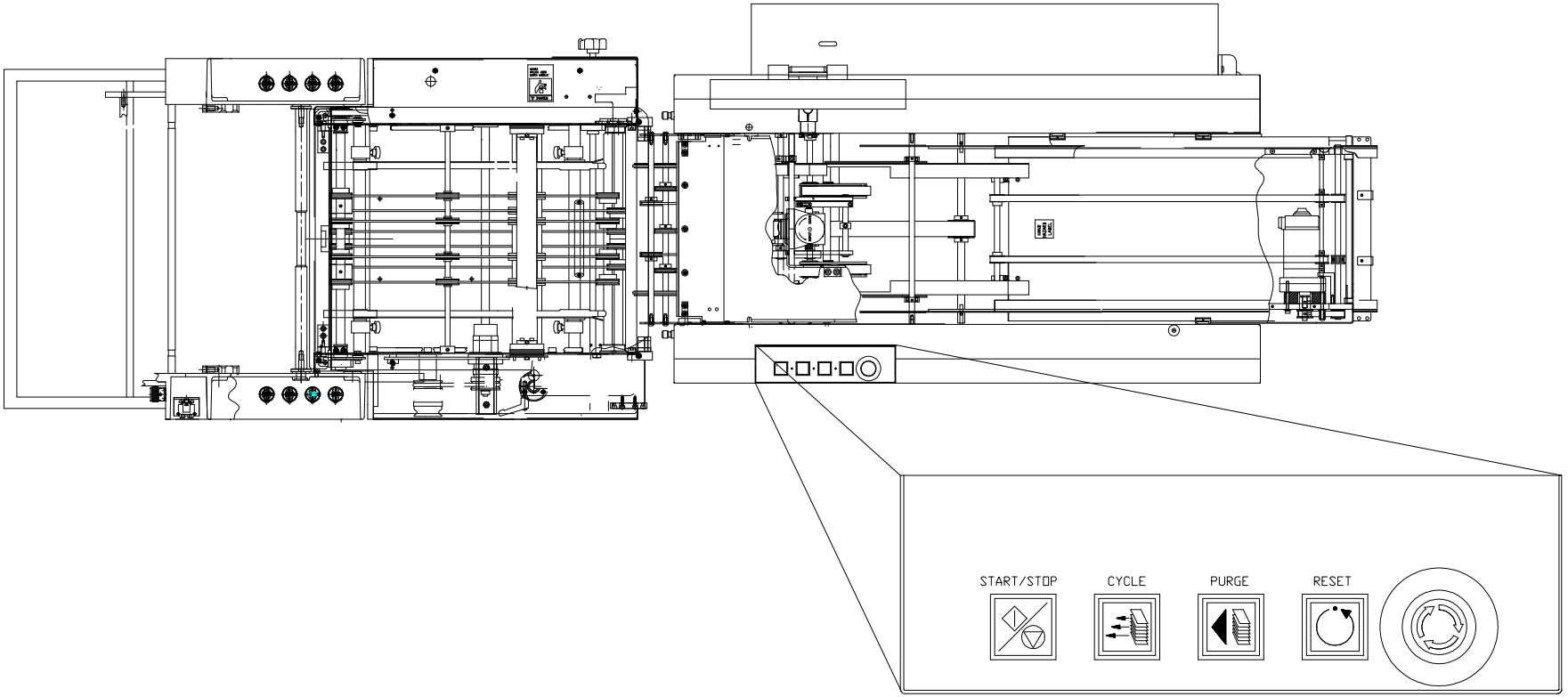
Layout of Model 438 V4 (Operator / Left Side View)



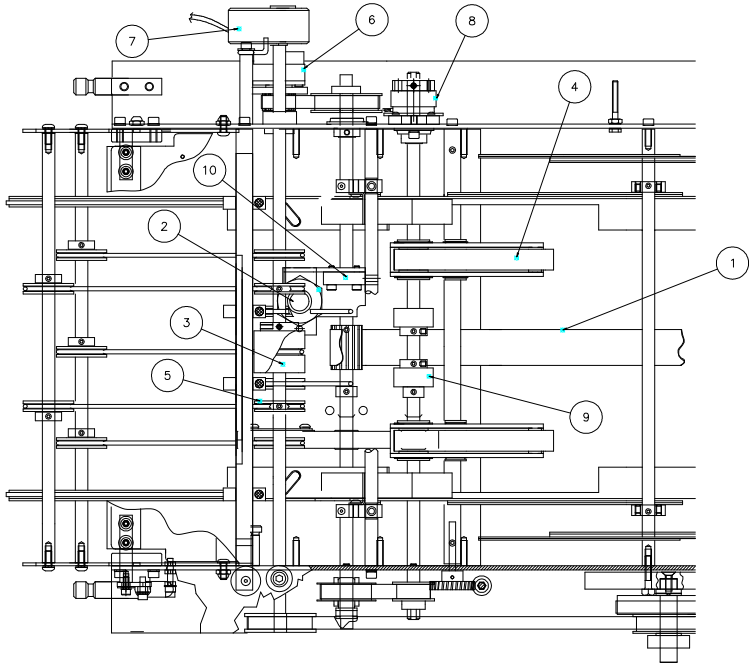
ITEM	QTY	DESCRIPTION	PART NUMBER
5	1	Transfer Conveyor	750-28979-501
4	1	Folder, Universal	703-28578-502
3	1	Accumulator Assembly	702-30205-501
2	1	Feeder Assembly	549-28580-501
1	1	Cabinet Assembly	005-28579-501

Parts List

Layout of Model 438 V4 (Top View)



A.3a Feeder Section



Item	Description	Part #
10	Feed Sensor	057–31240–000
9	Feed Rollers	600B–16430
8	Brake Assembly	002B–08157
7	Feed Speed Encoder	070–PU2E
6	Feed Clutch	122–27256–500
5	Drive Pulley	600A–16349–020
4	Outside Feed Belts	002B–21905
3	Pullout Roller	600B–17540
2	Ultrasonic Double Detect Sensor	057–30548–000
1	Main Feed Belt	113–S290XL100

Parts List

Feed Belt

The Main Feed Belt is a one inch wide beige timing belt which drives the bottom sheet of paper under the singulator roller. Also called Singulator Belt.

Auxiliary Feed Belts

These are two urethane belts located either side of the main feed belt. The auxiliary feed belts assist the main feed belt, smoothing variations in frictional drive (correcting erratic feeding of the paper).

Drive Rollers

These two orange rollers are located directly below the singulator. These are used in conjunction with the singulator to ensure only one sheet is fed at a time.

Paper Level Detector

This demand switch monitors the paper going into the feeder area. Its job is to limit and demand the amount of paper that is most productive to the feeding process. The Paper Level Detector monitors the paper through a metal wand.

Feed Sensor

The Feed Sensor monitors the output of the singulator for proper singulation or non-feed of paper. The sensor module is located next to the double detect sensor in the singulator area.

Double Detect Sensor

The double detect sensor is ultra sonic sensor which does not require electrical adjustment. The mechanical position of the sensor is 40mm above the mounting plate +/- 2mm. The sensor determines that two sheets have been fed by a field induced between the two pages.

Feeder Speed Encoder

A blue-clad optical encoder located on the right side of the upper pullout shaft. It is used to detect feeder run speed.

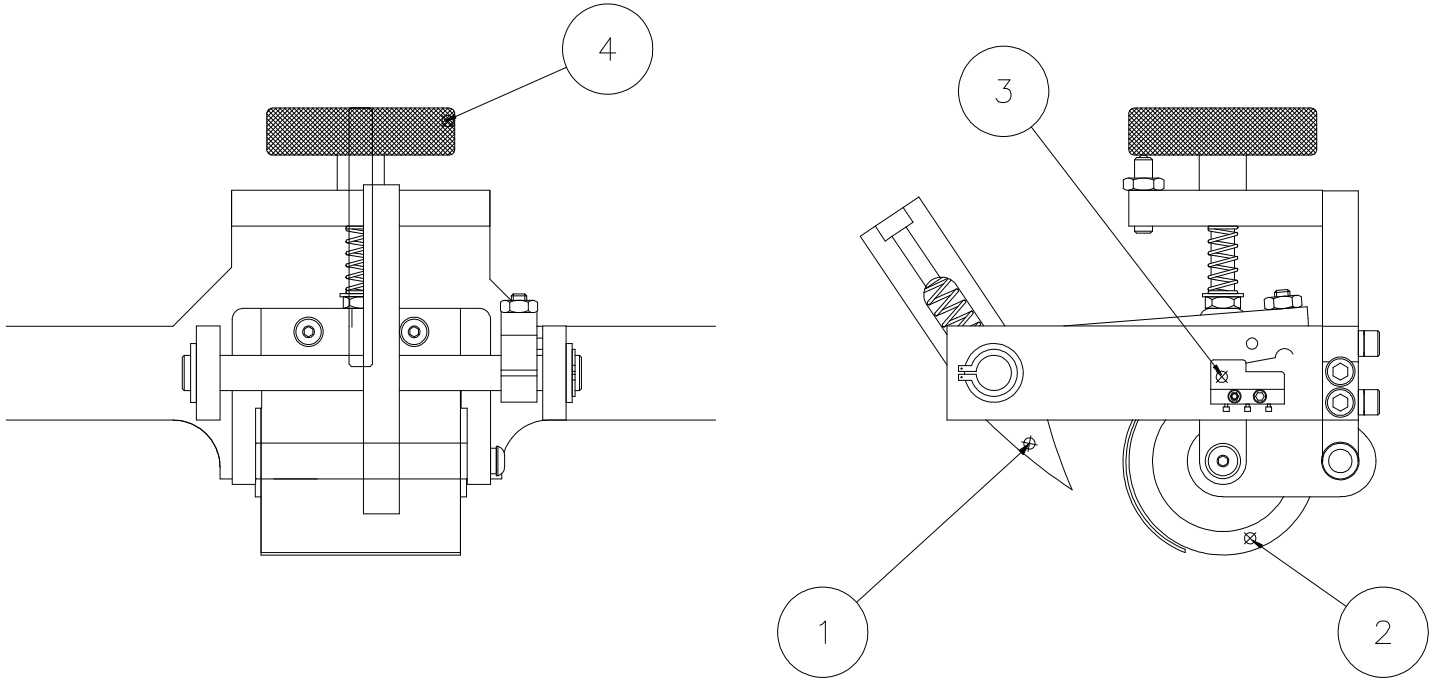
Feed Clutch

Electrical clutch which engages the feed belt at a signal from the controller.

Read Sensor

A through beam sensor located on the reader bracket which is mounted to the crossbar. A reader logic board interprets variation in light intensity as it is reflected off the paper and code marks.

Singulator



Item	Description	Part #
4	Singulator Adjust Knob	600B-16435-009
3	Paper Demand Switch	002B-08212
2	Singulator Roller	177-25913-600
1	Paper Level Detecter	600a-16435-005

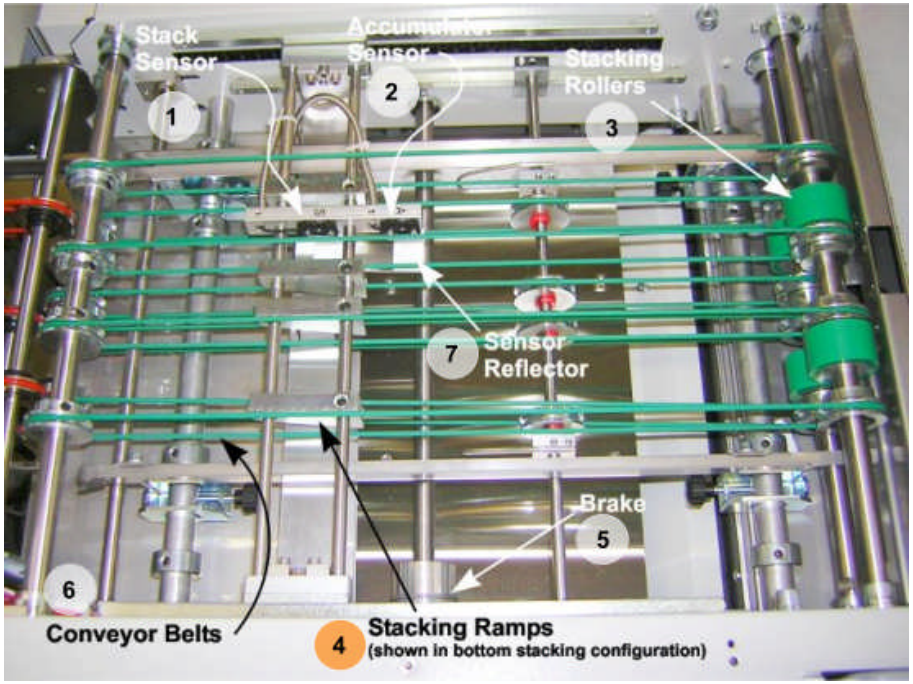
Parts List

A.3b Accumulator Section

The accumulator is fed paper from the singulator, assembling groups of one to seven documents. When the document package is complete, it is fed to the folder.

Stacking Ramps

Stacking Ramps are the plastic wedges which position successive pages of a



document package in order.

Stacking Rollers

These are used to stop the paper and hold it in position. When released, the Stacking Rollers drive the collected pages out of the accumulator.

Dump Brake

This prohibits the rollers from releasing paper from the accumulator.

Dump Clutch

This activates the stacking rollers, releasing the accumulated pages.

Accumulator Sensor

The Accumulator Sensor indicates presence or absence of a package in the accumulator. It also monitors package discharge when the dump clutch has been engaged.

Stack Sensor

Located at the edge of the ramps, the stack sensor indicates the document has cleared the stacking ramps.

Sensor Modules

The Sensor Module for the Accumulator and Stack Sensors are accessible by removing the right side accumulator cover.

7	Sensor, Reflector	Part of Sensor
6	Belt, Conveyor	186-031033097
5	Brake	121-26564-000
4	Stacking Ramps	186-032051604
3	Stacking Rollers	177-28468-600
2	Accumulator Presence Sensor	057-32041-000
1	Accumulator Stack Sensor	057-32041-000
Item	Description	Part #
Part List		

A.3c Folder Section

The folder is capable of placing 1 to 7 sheets in a C, Z, or double V configuration. It is fed by the Accumulator Section.

Buckle Plates

Manual adjustable plates which set the distance of the fold from the edge of the paper.

Rollers

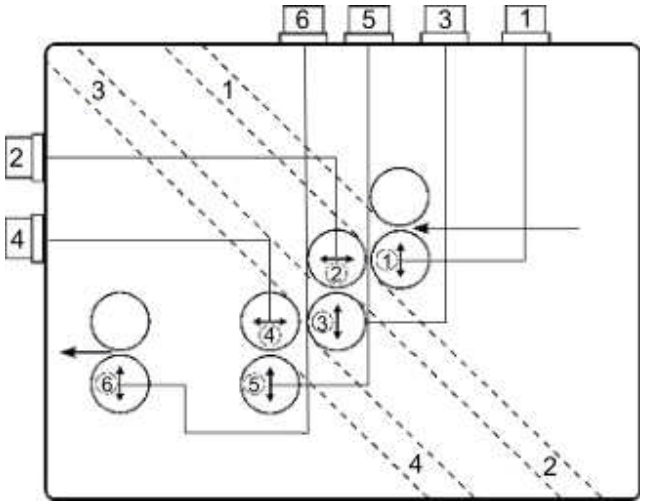
Used to nip the paper as it is buckling, creating the fold.

Folder Drive Motor

A motor which drives all folder shafts and rollers and the upper and lower dump shafts on the accumulator.

Folder Speed Encoder

An encoder, located on the exit roller shaft, which provides a folder speed signal.



Folder Section Representation

A.3d Exit Conveyor

Straight Conveyor (AM52 Delivery)

This is an optional stand alone straight conveyor that enables the 438 to be used in a “stand alone” configuration.

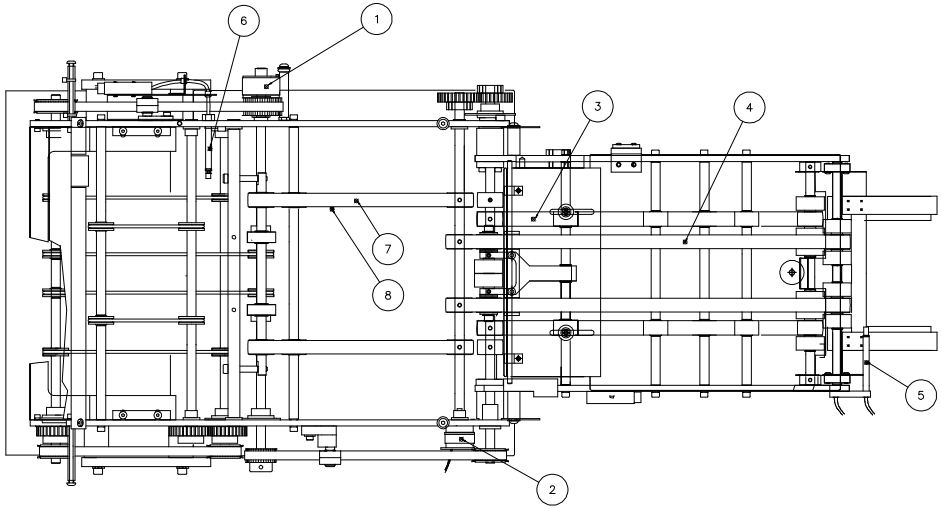
Transfer Conveyor (8.5” and 11” versions)

Transfer Conveyor Package Presence Sensor and Module

This monitors the presence of paper packages in the first station of the transfer conveyor.

Transfer Conveyor Discharge Sensor and Module

This monitors the discharge of paper packages from the output conveyor. It acts to confirm the processing of specific documents.



ITEM	DESCRIPTION	Part #
8	Belt, Nip Drive, Lower, Green	600B–17745
7	Belt, Idler, Upper	600A–17744
6	Package Presence Sensor Ass'y (includes Amp)	002B–08487
5	Discharge Sensor Ass'y (includes Amp)	002B–08486
4	Belt, Exit, Upper, Green	600B–17747
3	Belt, Exit, Lower, Green	600B–17746
2	Brake	002B–08408
1	Clutch	002B–08409

Parts List

A.3e Emergency Stop Interlocks

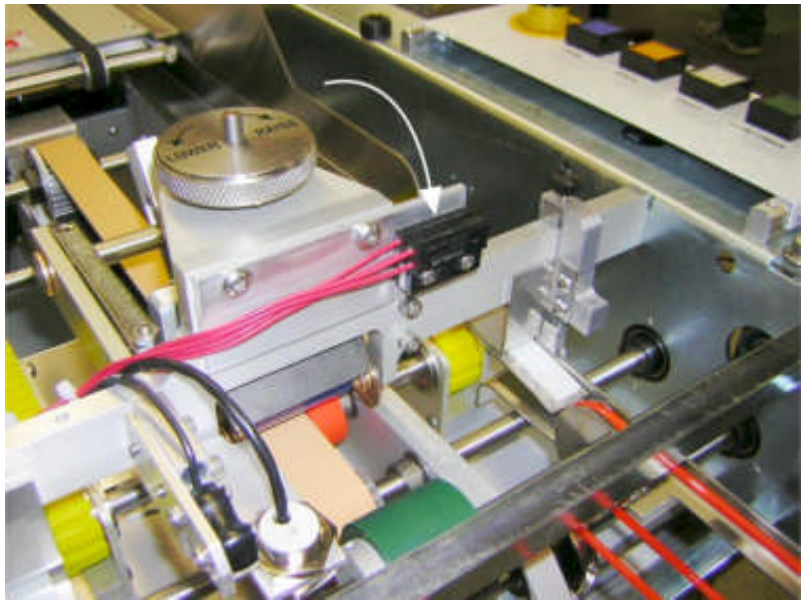
The main E-stop located on the operator panel will interrupt power to the conveyors and folder when pressed down. This switch must be twisted to bring it back to its original upper position.

An extra contact is provided on this E-stop switch which is routed to pins 30 and 33 of the Inserter Connector located on the adaptor plate on the end of the cabinet. This will affect an E-stop to an external device when these contacts are wired to the E-stop circuit on that external device (e.g. Pinnacle).

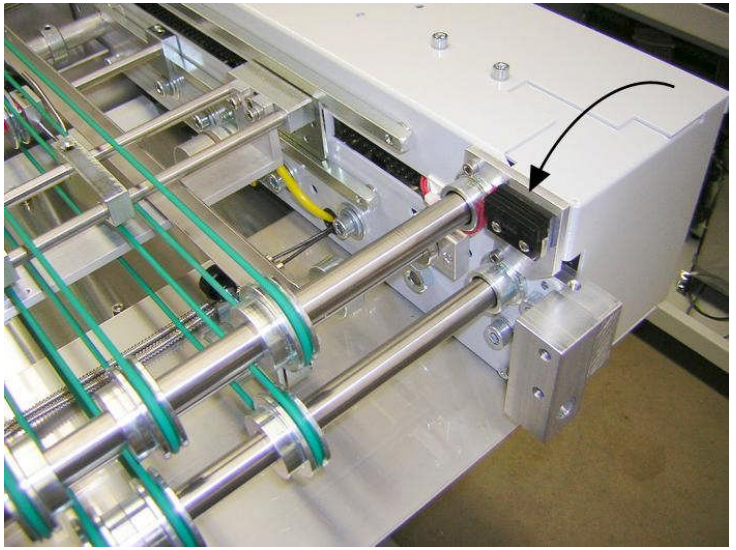
A connection to the 438 interlock string has been provided on pins 28 and 29 of the same Inserter Connector which allows an external device (e.g. Pinnacle) to E-stop the 438. For this E-stop string to be functional a blue jumper across pins 24 and 25 of Module #7 on the I/O Board must be removed. If this E-stop string is not used this jumper must be in place.

Pin 11 of this connector also provides an "Interlock Sense" signal to an external device.

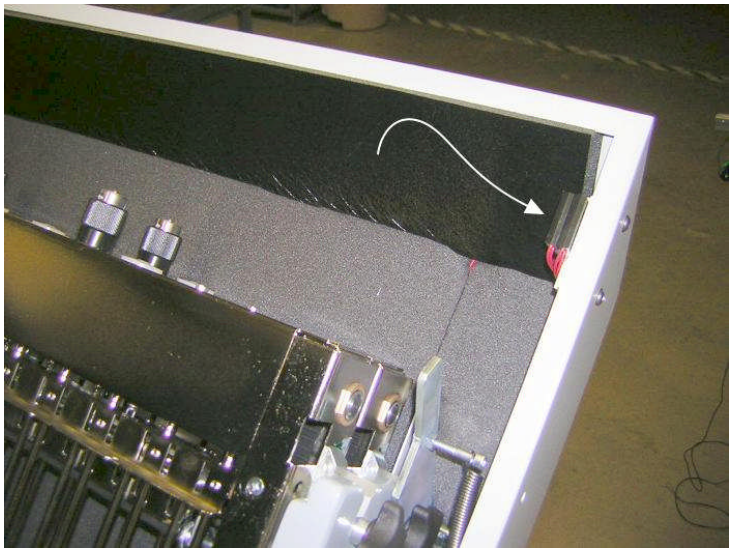
There are five (5) safety interlock switches that will interrupt power to the conveyors and folder whenever a cover is opened:



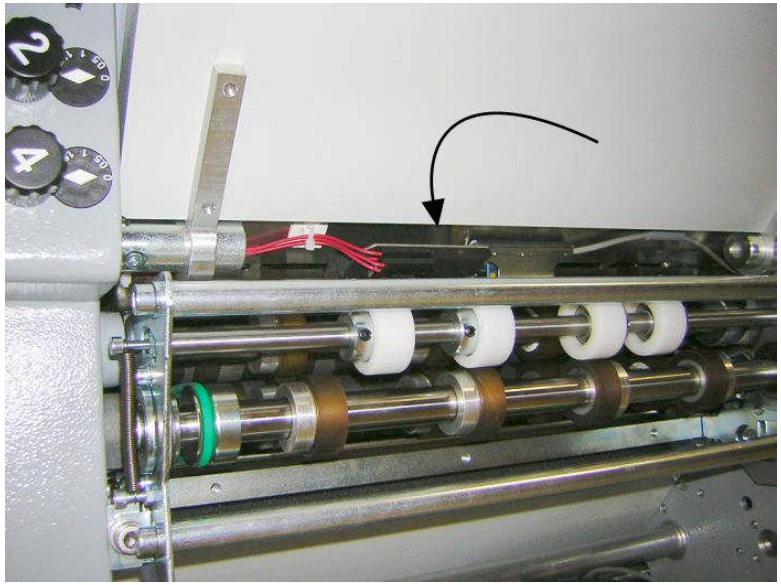
1. Feeder Cover Interlock



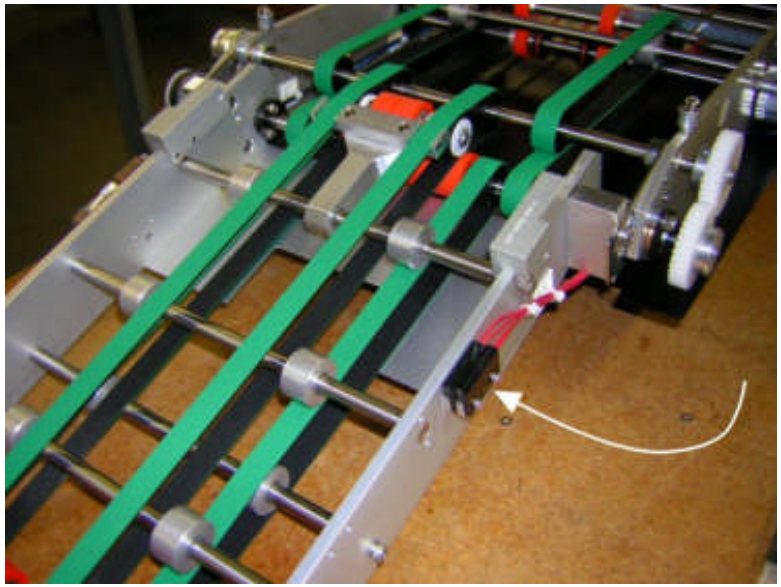
2. Accumulator Cover Interlock



3. Folder Upper Cover Interlock



4. Folder Exit Interlock



5. Transfer Conveyor Cover Interlock

A.4 MACHINE SPECIFICATIONS

Listed below are specifications for the 438:

Throughput

Speed: Max. 30,000 documents per hour

Material

Paper Weights: 20# (75 GSM) to 24# (90 GSM), Inquire for heavier weights
Paper Size: 7” x 7" (178 mm x 178 mm) to 11” x 14” (305 mm x 356 mm)
Loading Capacity: 1,500 sheets of 20# bond.
Fold Types; "C", "Z", "V" & DOUBLE "V"
Porosity: 20 Gurley seconds
Stiffness: 20 Lb. Stock, 170-225 Gurley Stiffness Units
24 Lb. Stock, 250-300 Gurley Stiffness Units
Cross Grain Stiffness: 20 Lb. Stock, 8~125 Gurley Stiffness Units
24 Lb. Stock, 12~150 Stiffness Units
Moisture Content 4-6% by Weight

Components

Feeder: Bottom feed, top loading for continuous operation.
Optical Reader: Optical code reading for group batch recognition, sequencing and double printing control of 1 to 12 document groups. Larger group batch setting available upon request.
Folder: 4 plates.
Group selector: Manual group selection for 1 to 12 sheets.
Counter Modes: Total count, batch count, resettable count.

Output Conveyor Options:

Version 1—with shingling output conveyor/stacker
Versions 2—with intelligent transfer conveyor interface to gripper arm of inserter’s insert station.
Version 3—with a buffering, intelligent transfer conveyor interfaces to an open feed station of inserter The GBR 438-3 can also convert an intelligent, continuous form mail inserting system to a cut sheet operation.
Controller: Adjustable operator's panel with readout and touch screen access to all system functions. System is microprocessor controlled with self-diagnostics and error display including double, misfeed, and jam detection.

Electrical Service

208 volts, 3 phase-Y, 20 amp, 4 pole, 5 wire grounding - use NEMA L21-20R
220 volts, 1 phase, 20 amp, 3 pole, 4 wire grounding - use NEMA L14-20R
1,000 BTU/hr
Fuse List - Refer to Section D10

Dimensions (includes feeder, accumulator, folder, and transfer conveyor)

Length: 106" (mm)
Width: 26" (mm)
Height: 58” (mm)
Weight: Net approx. 725 lbs. (kg)

Read Options

Line Code (B+H or GBR)
Bar Code

A.5 RUN SCREEN

This screen is displayed continuously for informational purposes until “Test” or “Setup” is selected.

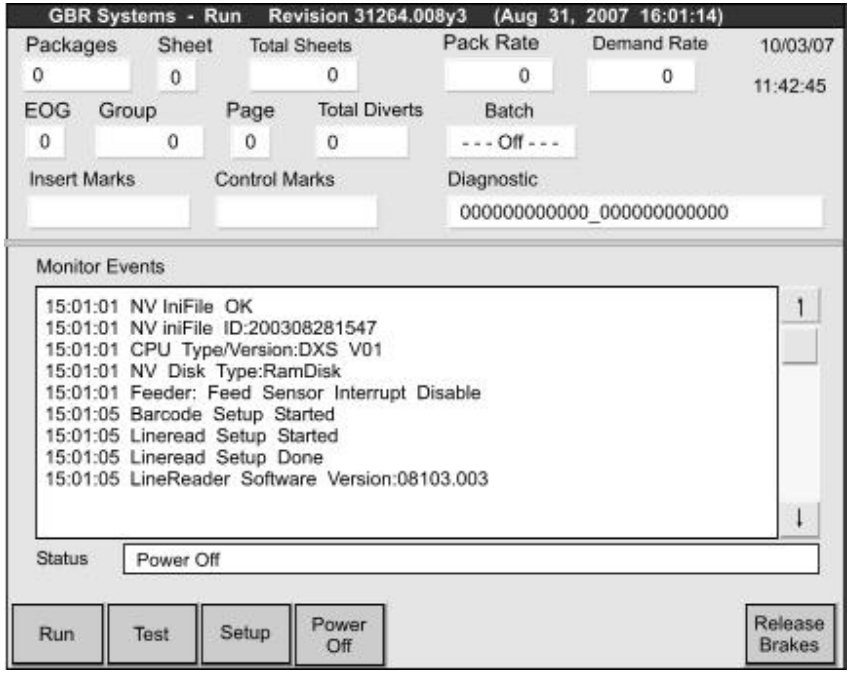
(See Section A.7 for “Setup” Screens)

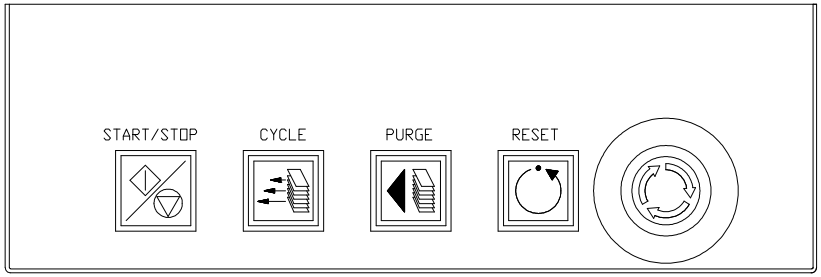
(See Section D “Problem Analysis” for “Test” screens.)

- **Run** – The current screen.
- **Test** – Press to enter diagnostic screens (for more information, refer to Section D).
- **Setup** – Press to enter setup screens (for more information, refer to Section A.7).
- **Release Brakes –** Releases/Applies Accumulator and Feed Brakes to allow jam clearing.

Information Displayed:

- **Revision** (Software) and **Build Date** – top line
- **Packages** – Total package counter. Reset in **System Setup**. Also resets during bootup.
- **Sheet** – Displays the # of sheets in the accumulator.
- **Total Sheets –** Displays the number of sheets fed from the time the system was powered up. Resets on machine power down.
- **Pack Rate** – Used to monitor throughput of the 438. Calculated at every pack dumped from accumulator (not averaged).
- **Demand Rate**– Displays the package demand rate from the inserter. Calculated at every demand signal transition (not averaged).
- **Date and Time** - (not functional at this time)
- **EOG** – Displays end of group (ready for dump).
- **Group** – Displays group sequence number after read.
- **Page** – Displays page sequence number after read.
- **Total Diverts** – Displays the number of diverts since the start of the run.
- **Batch** - displays “Batch Sheet” or “Batch Package” count, resets on sequential stop
- **Insert Marks** – Displays which insert are selected after each read.
- **Control Marks** – Displays any controls marks, such as IM (Ink Mark) after read.
- **Diagnostic** – Internal timing
- **Monitor Events** – Displays event history, however, entire list is lost when power is turned off.
- **Status** – Displays machine status such as “Power Off”.





A.6 KEYBOARD OPERATION

START / STOP

Press to start all motors and enter ready mode

Press while in ready mode to shut down the 438

CYCLE

Press quickly to feed one sheet

Repeat until EOG on display is “1”, **DUMP**

Press and hold CYCLE to start continuous feeding

PURGE

Press after manually filling the accumulator to discharge package into the folder

RESET

Press after interlock is broken or E-stop condition

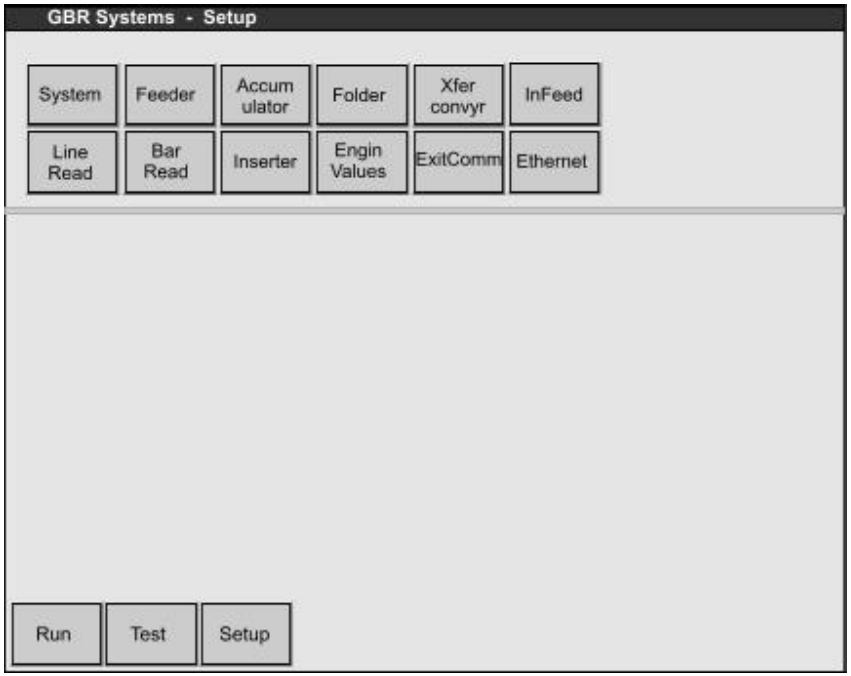
E – STOP

Press to shut down all motors on the 438 in emergencies

E-Stop must be twisted to bring back to original position

Lifting any cover will also shut down all motors on the 438

A.7 SYSTEM SETUP SCREEN



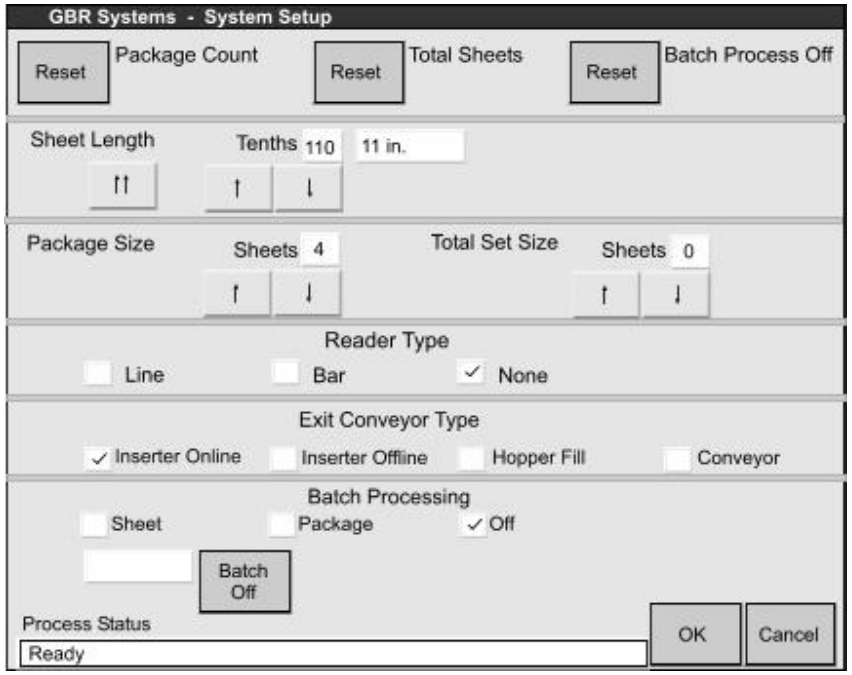
Press **Setup** while in the **Run** screen.

This screen provides access to all 438 setup screens.

Press **Run** to return to the “Run” screen.

Note: Normal factory settings are in bold font.

A.7a Setup



Package Count "Reset"

Resets total package count ("Packages") found in Run screen. This value will also reset automatically on power down of machine.

Total Sheets "Reset"

Batch Process "Reset" (On/Off status is also displayed)

Resets the "Total Sheets" or "Total Packs" (depending on which option was selected) found in the Run screen. This value will also reset automatically after the sequential stop determined by the batch size entered. A sequential occurs when the last pack is accumulated, the machine stops feeding, purges the accumulator and transfer conveyor to the inserter, then powers down.

Sheet Length

Double "Arrow Up" button increments, in tenths of an inch, to standard sheet sizes 7", 8.5", 11", 14", A4, and A5

"Single Arrow" buttons adjust sheet length in tenths of an inch

Package Size

Max Pages in Accumulator. 1 to 12

For Read, 1 greater than max expected (5 for the LineCode test set). Or number of fixed pages with no read.

Reader Type.

Line, Bar, None (Off)

Exit Conveyor Type

Inserter Online. By demand. See Inserter Setup 1 for Open Station or Gripper Arm setup.

Inserter Offline. Selecting this allows the inserter to run independent of the 438 without physically detaching.

Hopper Fill. Select "HOPPER FILL" when the inserter will be taking the folded documents from a hopper. With or without demand. See Eng. Value 20. With no Inserter.

Conveyor. with or without demand. See Eng. Value 20, (selects whether or not to ignore the demand signal), with no Transfer Conveyor (Xfer Cvyr). Exit at Folder with Folder Exit Sensor for straight shingling style of stacking conveyor.

Batch Processing

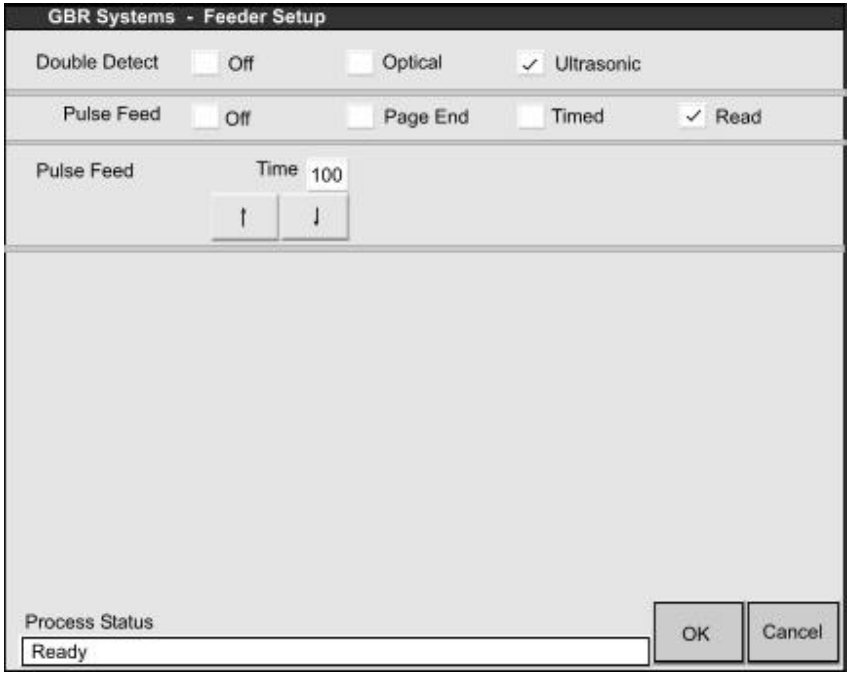
Sheet: Select job size by entering the number of sheets to run. When selected the "Batch Off" button changes to "Set Sheets". When "Sheet" is selected and a batch size entered, the machine will complete the package containing the last sheet.

Package: Select job size by entering the number of packages to run. When selected the "Batch Off" button changes to "Set Packs"

Off: Disables Batch Processing

"Batch Off" Button: Changes to "Set Packs" or "Set Sheets" depending on the option selected. Press to enter batch value, a numeric keyboard is displayed, then press "=" to set. Batch value is displayed to the left of the button. This button is not available when Batch Processing "Off" is selected.

A.7b Feeder Setup



Double Detect Enable

Select to have the 438 detect double feeds. Optical is a thru-beam sensor whereas Ultrasonic detects the interference of air between two or more sheets fed.

Deselect if paper stock is causing false double detects.

Pulse Feed

Deselect to engage clutch for the entire pack. AKA “Stream Feed”.

When selected the feeder will place a larger gap between the sheets by turning the clutch on and off for each page fed.

Page End.

Clutch is off at lead edge of page, on again at trail edge of page.

Timed

“Pulse Feed Time” must be set when using this option.

Clutch is off at lead edge of page, on after Time (for Timed).

Read

Clutch is off at lead edge of page, on after read received.

Pulse Feed Time

Use when “Timed” is selected

Higher the number, the larger the gap between sheets.

A.7c Accumulator

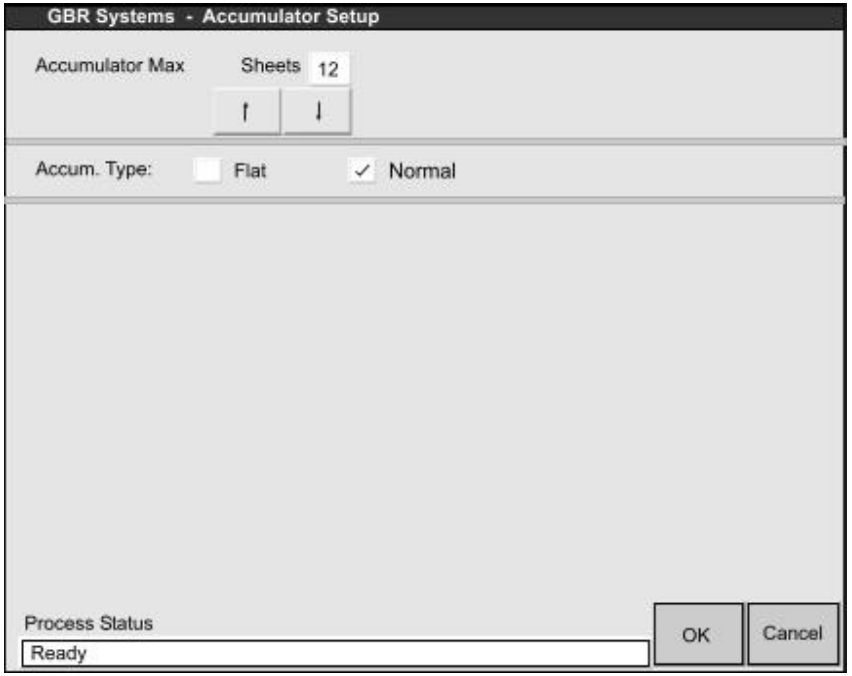
Accumulator Max

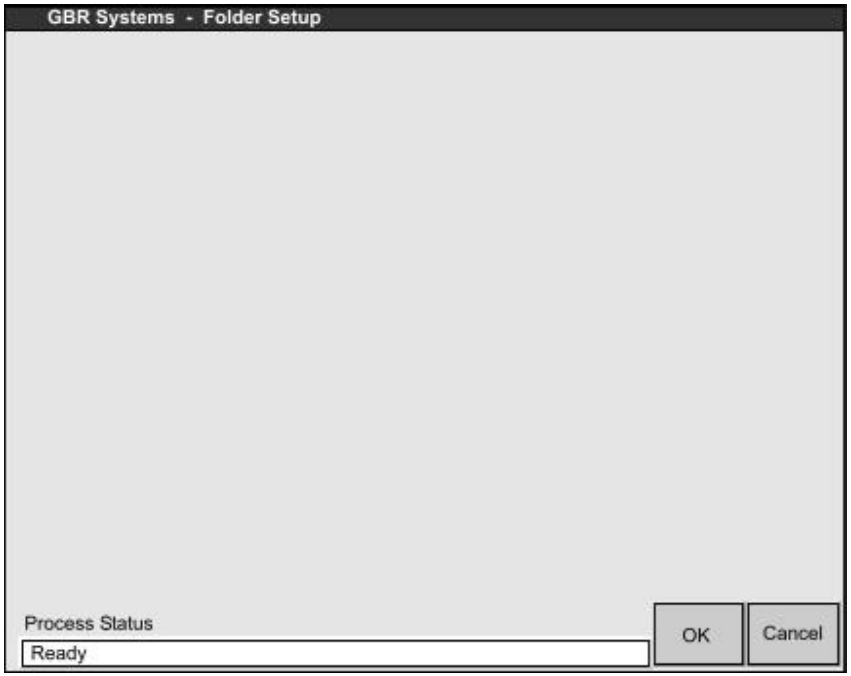
Select up to 12 sheets maximum, the 438 will shut down on the 13th sheet fed into the accumulator. This function prevents damage to the folder.

12 may be selected when it is not desirable to have a package split into subsets. The 438 will still shutdown on the 13th sheet. The operator must clear the accumulator and manually process the package.

Accumulator Type

Flat or Normal



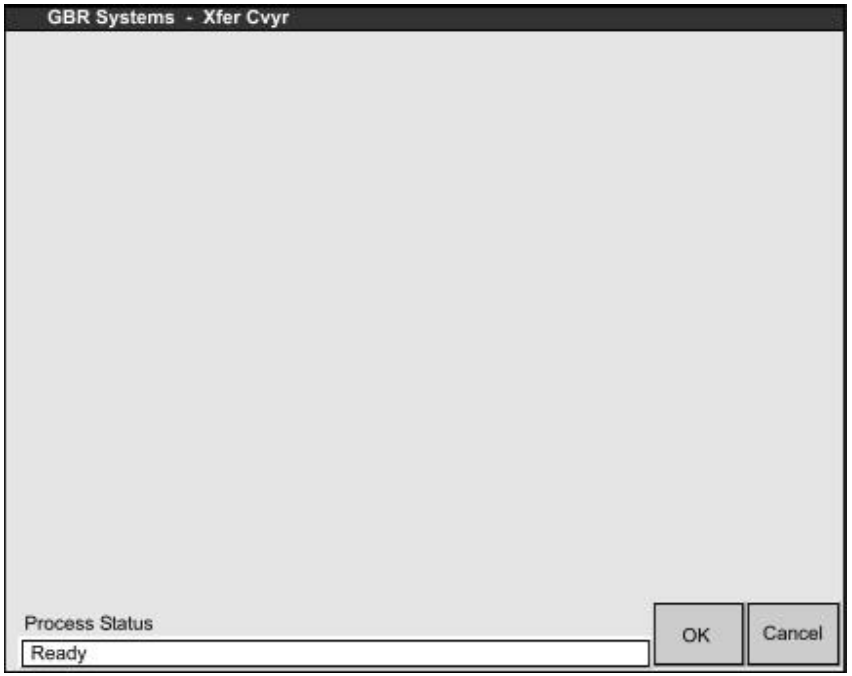


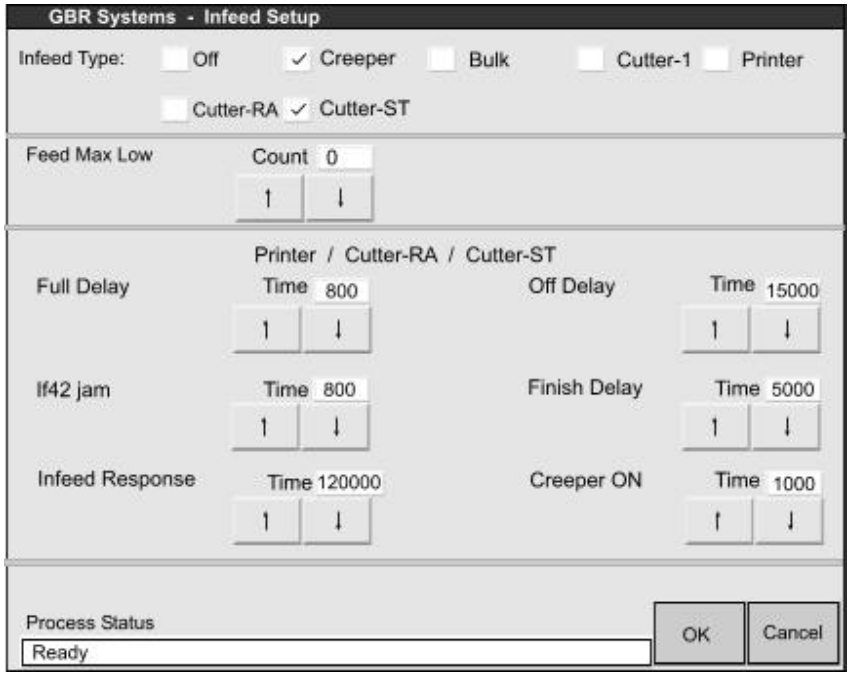
A.7d Folder

Folder Enable

Leave selected (not functional at this time).

A.7e Xfer Cvyr (Transfer Conveyor) Setup





A.7f Infeed Setup

Infeed Type:

Off

Creeper: Select when using the standard 2000 sheet creeper conveyor.

Bulk: 470 type bulk loader with on/off control by software monitoring the paper demand switch.

Cutter – 1 Guillotine type cutter/feeder

Printer Flat sheet printer feeder

Cutter-RA A guillotine cutter set in right angle configuration feeding onto a right angle or turning device then feeding into the accumulator.

Cutter-ST A cutter feeding directly into the accumulator.

Feed Max Low:

Pertains to a friction or suction feeder wherein a setting can be made to set the number of sheets left in the feeder. It will set the number and prevent the feeder from running out completely preventing the operator from having to reload from scratch.

Printer / Cutter-RA / Cutter-ST:

This setup section allows the operator to set a time delay for each of the following feeding devices. The function of the delay is the same for each device; it enables the document some amount of time to feed into the accumulator or it will declare an error**.**

Full Delay – Enter time of delay desired

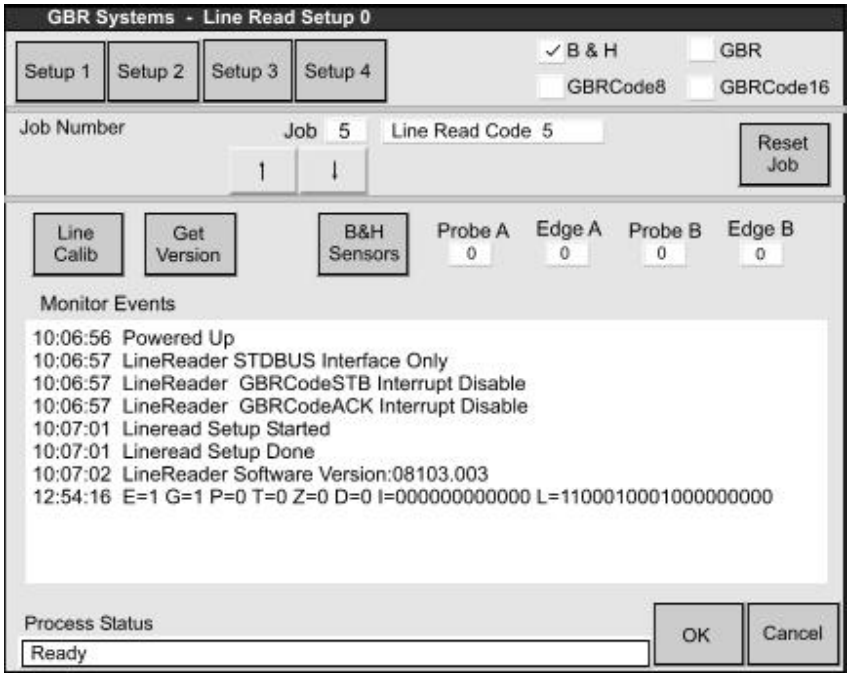
IF42 Jam – Enter time of delay desired

Finish Delay – Enter time of delay desired

Infeed Response – Enter time of delay desired

Creeper On – Enter time of delay desired

A.7g Line Read Setup 0



Note: Refer to Section A.9 for an explanation of GBR Line Code Read.

Setup 1 – Refer to Section A.7j

Setup 2 – Refer to Section A.7k

Setup 3 – Refer to Section A.7l

Setup 4 – Refer to Section A.7m

Select: "Line Read Type"

B&H Read

GBR Read

GBR Code 8

GBR Code 16

Job Number

System will save all the parameters for up to 10 line code jobs. To program: select a job number, set all settings for the job in Line Read Setup 1, 2, and 3 screens. Pressing the OK button in each setup screen saves those parameters to the job number selected.

Reset Job

Press this button to reset the job parameters to the default values for the job selected.

Line Calibration

Note: Used only for B+H Line Read or GBR Line Read. Do not try to use this feature for GBRCode8 or GBRCode16, it will not work.

This function will calibrate the line code reader for proper location of marks for interpretation of code. Before pressing "Line Calib" make sure Reader Type "Line" in System Setup screen is selected. "Read" must be selected in Feeder Setup and all sensors must be properly adjusted. All Line Read Setup screens must be setup. Select Calibration "On" in Line Read Setup 2 before starting and "Off" when finished.

Get Version:

Pressing this button results in printing the software version of the LineReader on one line of the "Monitor Events" window.

B+H Sensors

Note: For use with either B+H or GBR Line Read.

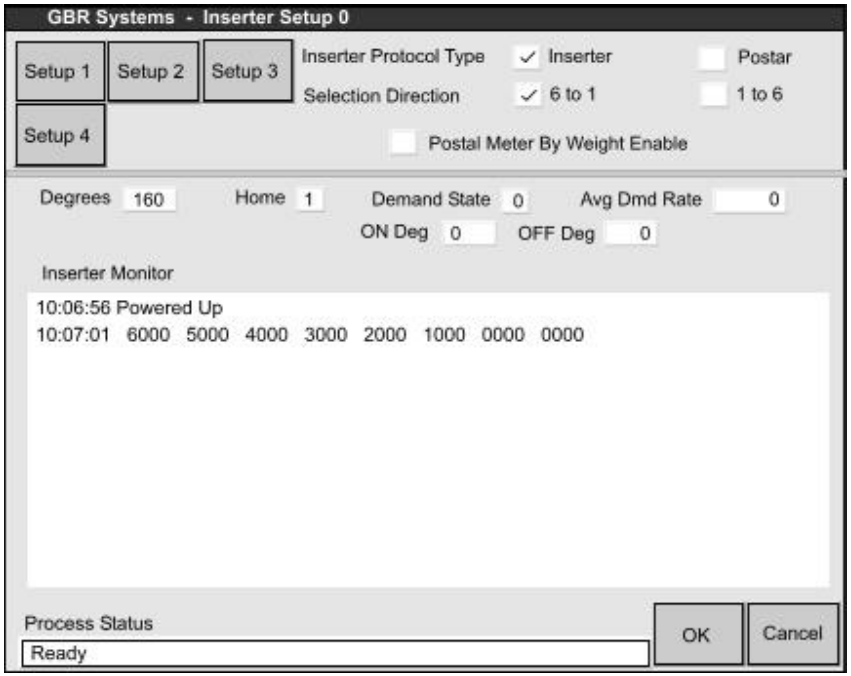
Enables viewing the action of the sensor signals for diagnostic purposes.

Monitor Events Window: It is intended to give the operator or technician feedback regarding the status of what is occurring.

A.7h Bar Read Setup 0

Refer to Section A.? for setup information.

A.7i Inserter Setup 0



Setup 1 - Inserter Type & Feature Selection

Setup 2 - Inserter Station Feature & Setup

Setup 3 - Postal Meter Feature Selection

Setup 4 - Inserter Encoder & Timing Setup

Inserter Protocol Type

Select either “Inserter”, or “Postar” The following I/O points have dual usage depending on Protocol selected and interface PCB used (002d-08138 or 002d-07599).

I/O Rack #1 (RIGHT)

INSERTER (U.S. Application)	POSTAR (Typical European Application)
1-04 = Separation Sol #	Postar Data Bit #1
1-05 = Separation Sol #1	Postar Data Bit #2
1-06 = Separation Sol #8	Postar Data Bit #3
1-07 = Shingle Conv Motor	Postar Kicker
1-08 = Separation Sol #2	Postar Data Bit #4
1-09 = Separation Sol #3	Postar Data Bit #5
1-10 = Separation Sol #4	Postar Data Bit #6
1-11 = Separation Sol #5	Postar Data Bit #7
1-12 = Separation Sol #6	Postar Data Bit #8
1-13 = Separation Sol Env	Postar Data Bit #9
1-14 = Ink Marker Sol	Postar Data Bit #10
1-15 = Env Flap Sns Dis	Postar Data Bit #11
1-16 = Emergency Stop	Postar Data Bit #12
1-17 = Ins Station 1 Error	Postar Error Bit
1-19 = Postal Meter Divert	Postar Strobe Bit
1-22 = Cutter Jam Sensor	Postar Kick Sensor

Selection Direction is used for setting the protocol for insert station numbering.

Postal Meter by Weight Enable – To select the Postal Meter Stamping feature.

Degrees – The Inserter Encoder updates this window as the inserter runs.

Home – The home position of the inserter can be seen shifting from a zero to a one when the inserter is at home position.

Demand State

Operates in Demand Type “Switch” or “Degree” (see Inserter Setup 1), 3=ON, 0=OFF

Average Demand Rate

Diagnostic - averages Demand Rate over three cycles

ON Degrees

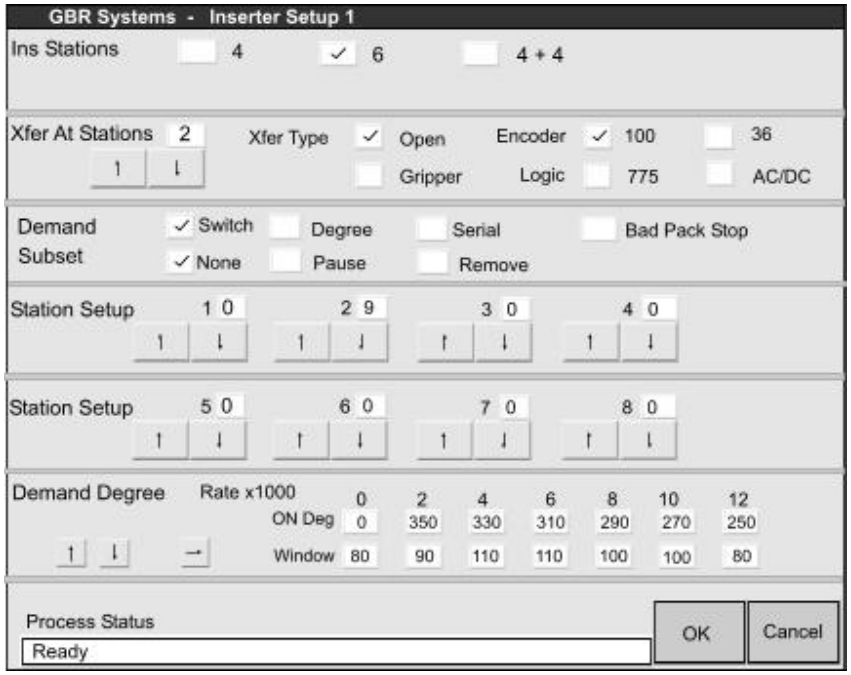
Degrees where demand goes on by either “Switch” or “Degree” demand

OFF Degrees

Degrees where demand goes off by either “Switch” or “Degree” demand

Inserter Monitor – Prints events

A.7j Inserter Setup 1



Ins Stations

- 4, 6, 4+4, Choose Inserter configuration.

Xfer At Stations

- Select “0” for GRIPPER, “1” - “9” for Open feed.
- Normally set to "GRIPPER" (Inserter takes the folded document from the 438)
- Select "OPEN FEED" when the 438 will be placing the folded documents directly on the inserter track. When using open feed, selected number represents the number of stations prior to the first insert station the package was placed.

Encoder Type

- 100 Tick or 36 Tick

Logic Type

- 775 – 420T/438 control of 775 Inserter functions, station Select, Envelope Disable, Envelope Flap Detect Disable, InkMark, Divert, Postal Meters.

AC/DC – 420T/438 control of non-775 Inserter functions, station Select, Envelope Disable, Envelope Flap Detect Disable, InkMark, Divert, Postal Meters.

Demand Type

Switch: Select when demand signal is provided by a magnetic switch

Degree: Select when demand signal is provided by an encoder

Serial:

Select: when demand signal is provided through an RS232 interface by a semi-intelligent inserter.

Bad Pack Stop Enable This box is defaulted “on” or “checked”.

The machine will stop on a bad pack and energize the bad pack indicator light on the inserter. If unchecked or “off”, the machine will not stop on a bad pack.

Subset Method of inserting more than one accumulated packs into one envelope on the inserter.

None: subset pause not used

Pause: inserter will not advance until the transfer conveyor feeds second pack into open feed station.

Remove: inserter will not advance and permits the operator to remove the packs deposited in the open feed station on the inserter.

Station Setup

Note: Insert Station positions are referenced from the station at which the documents are inserted into the envelope ("Insert Sta: 0"). Insert Station -1 would be the station downstream from Insert Station 0. Insert Station 1 is the Insert Station upstream from Insert Station 0.

When set to “0” the station is always off.

When set to “9” the station is always on.

If a station is down the next station in line can be programmed to take its place.

- Station Setup 1-4
- Station Setup 5-8

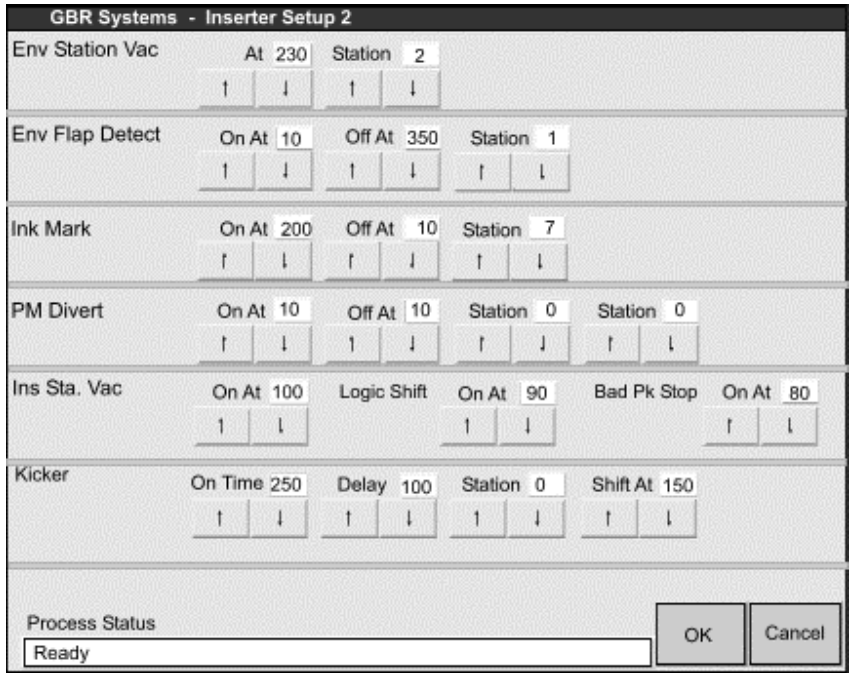
Demand Degree

This is similar to setting dwell time on an engine. As the speed of the machine is increased, home may be programmed at a position prior to 0 degrees allowing for lag time in components at higher speeds.

Degrees may be set for 0 thru12,000 cycles per hour in 2,000 increments.

Note: Inserter degrees are reset to zero at the occurrence of a home pulse for either inserter encoder.

A.7k Inserter Setup 2



Envelope Station Vacuum is normally enabled “At" 230. This is the position of the encoder (in degrees) at which vacuum is applied to the envelope hopper. “Station” is normally set at 2.

Envelope Flap Detect is normally set On at: 10, Off at: 350, and Insert Station :1(this is the location of the flap detect).

Ink Mark is an optional device that places an ink mark in varying locations to sort zip codes visually. "OFF At" is the number of chain movements AFTER envelope insertion. Ink Marking is normally located at Station 7.

PM Divert is normally set “On At” 10, “Off At” 12 and is normally located downstream from station 0.

Insert Station Vacuum is normally enabled at "100". This is the position of the encoder (in degrees) at which vacuum is applied to the insert station.

Logical Shift is normally set to "On At: 90". This is used to carry the data with the physical document.

Bad Package Stop is normally set to "On At: 80".

Kicker The Kicker routine is initiated by the extraction of an Ink Mark from read data.

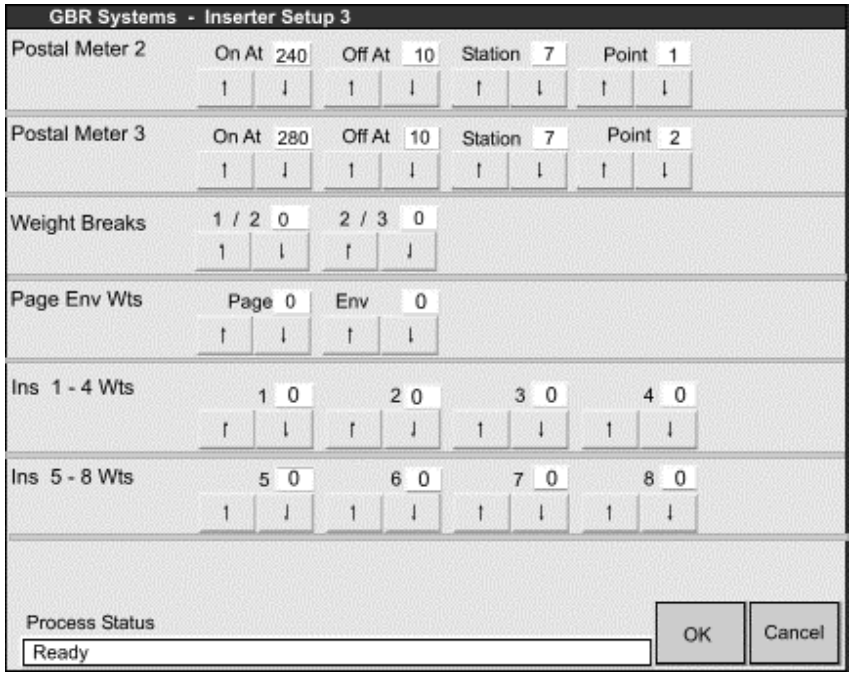
On Time Normally set to “On Time”: period of time in milliseconds that the Kicker will be ON or energized.

Delay: Period of time in milliseconds to delay the Kickers ON time from occurring. Range (0 to 990).

Station: The location on the deck of the inserter the Kicker will operate from when selected. Range (0 to 25). “0” disables the kicker routine. Station is referenced from the envelope insertion station in “Inserter” and from the first station in “Postar” outside of the transfer conveyor. “Station” must be set to greater than “0”.

Shift At: Logic shift for data adjustable to enable data to be shifted relative to inserter Home position thereby ensuring the “Kick” comes at precisely the correct moment.

A.7l Inserter Setup 3



PM Divert, Postal Meter 2, and Postal Meter 3

NOTE ON POSTAL METER WEIGHING: The 438 can accommodate up to three postal meters (PM Divert 2 and 3 are located in Inserter Setup 3). Based on the values entered in "Weight Breaks", "Page Env Wts", "Ins 1-4 Wts", and "Ins 5-8 Wts" (located in Inserter Setup 3) the document will be stamped by the appropriate postal meter. The dollar value must be manually entered in the postal meter.

The value you enter in the Postal Meter Weights can be any unit of measure as long as it is consistent. If one weight break is set to reflect ounces, all other settings must reflect ounces including the inserts and the postal meter itself. Likewise, if one is set to reflect grams, they must all be set to reflect grams. The numbers entered are relevant only to each other.

Postal Meter 1 (PM Divert in Inserter Setup 2) is normally set to "ON At" 200. This will enable the postal meter at the correct time. This value may need to be adjusted if the postal meter doesn't place the postage in the correct place. **Postal Meter 2** (found in Inserter Setup 3) should then be set to 40 higher than the new meter 1 value and **Postal Meter 3** should be 40 higher than 2.

"OFF at" xx should be set to "10" for all three.

"Station: 0" is set to the value of the last chain section of the inserter after the envelope stuffer and the turnover (04, 05, 06, 07, etc.), this is normally set to "07" on a six station inserter.

"Point" xx selects the postal meter output line to the 438, this is normally set to "0" for PM Divert, "1" for Postal Meter 2, and "2" for Postal Meter 3.

Weight Breaks

The 438 will total the weights of all documents, inserts, and the envelope and then send it to the correct postal meter. Because you are setting the weight breaks as well as the envelope, page, and insert weights it is important to keep the unit of weight (i.e. oz) consistent.

1 / 2 Enter the Weight Break of Postal Meter 1 to Postal Meter 2.

2 / 3 Enter the Weight Break of Postal Meter 2 to Postal Meter 3.

Page Env Wts:

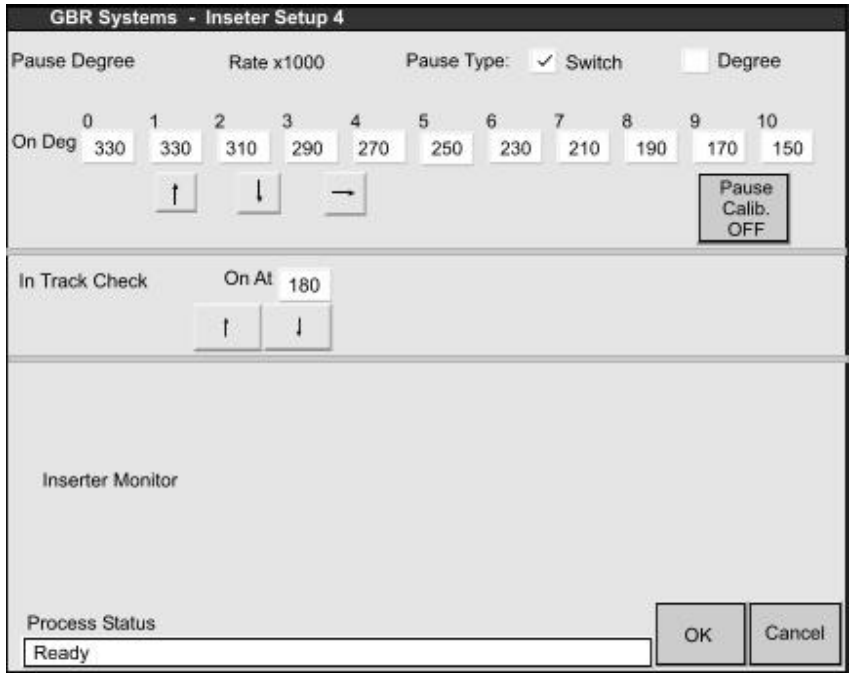
Page Enter the weight of the individual page, the 438 will sum the weight of all pages automatically.

Env Enter the weight of an individual envelope.

Ins 1-4 Wts and Ins 5-8 Wts Enter the weight of each insert in stations 1-4 and stations 5-8.

Refer to Section H.4 for an example of a Typical Postal Metering Setup Preset.

A.7m Inserter Setup 4



Pause Degree –

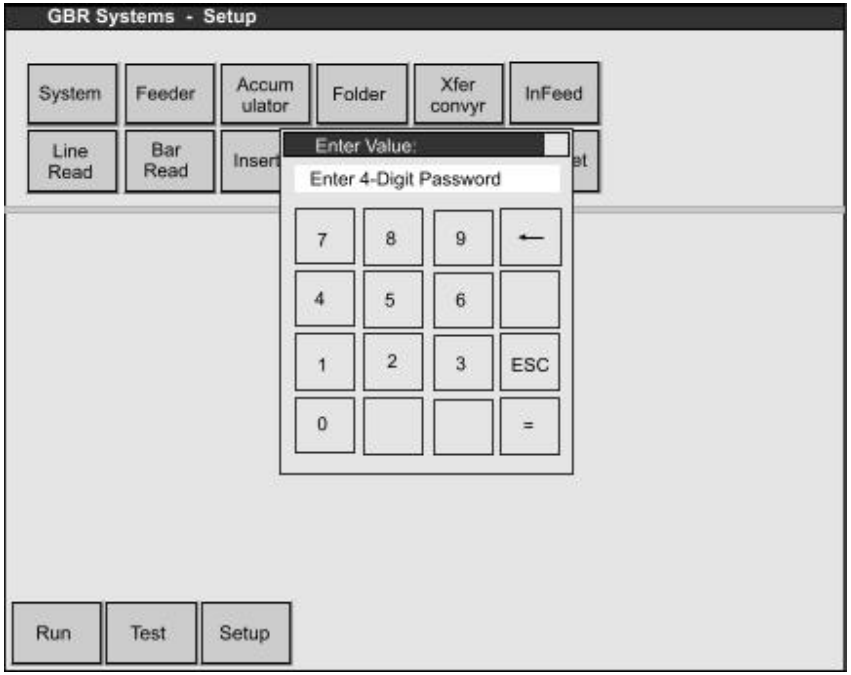
0	(0 to 999)	On Deg 330
1	(1000 to 1999)	On Deg 330
2	(2000 to 2999)	On Deg 310
3	(3000 to 3999)	On Deg 290
4	(4000 to 4999)	On Deg 270
5	(5000 to 5999)	On Deg 250
6	(6000 to 6999)	On Deg 230
7	(7000 to 7999)	On Deg 210
8	(8000 to 8999)	On Deg 190
9	(9000 to 9999)	On Deg 170
10	(10000+)	On Deg 150

Pause Type
Switch or Degree

In Track Check
"On At" 180

Refer to Section H.4 for an example of a Typical Postal Metering Setup Preset.

A.7j Engineering Values (Password Protected)



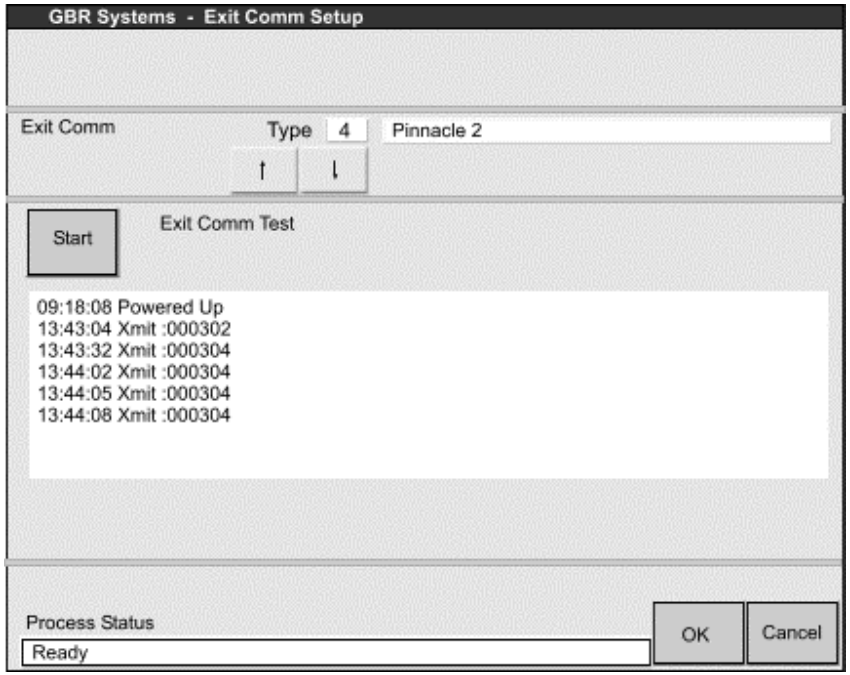
Value

For settings refer to Section A.8, for the default Engineering Values List.

Reset to Default

Press this button to reset only the current Engineering Value displayed back to its default value. This value is changed on the display only. Pressing the “OK” button saves the default value, “Cancel” exits and returns the Engineering Value to the prior value.

A.7k ExitComm



Type

0 No Comm
1 RR Donnelly 1
2 RR Donnelly 2
3 Pinnacle 1
4 Pinnacle 2
5 General
6 Tampa 1
7 Zaandam 1
8 Friedberg 1

Start Button

– Xmits test data in type selected. Displays response terminated by a CR, LF. Press again to stop.

Event List

A.8 ENGINEERING VALUES

These values are to be used as a starting point. These values may vary, depending on type and weight of paper being processed, environmental conditions, and system tolerances, in order to obtain optimal performance. The password to enter this screen is factory set to "4444". This password may be changed at Engineering Value #27.

(Eng. Software Version)

Number (31264.008y3) (xxxxx.xxx)

Number	Value	Description
01	20	**"Acc Feed Settle Time" (Range: 0 > 9995, Inc: 5)** Time(msec) after trail edge of last page passes Accumulator stack sensor into Accumulator until Accumulator clutch is fired.
02	40	**"Acc Dump Done Time" (Range: 0 > 9995, Inc: 5)** Advance Feed ON: Time(msec) from "Accumulator is going to dump" until next feed is started. A short value advance feeds, before the pack moves from the Accumulator. A longer time allows pack movement detected at the Accumulator presence sensor to start the next pack feed. Higher is safer, lower is faster, but assumes pack leaves Accumulator. Advance Feed OFF: Time(msec) from pack movement at the detected at the Accumulator presence sensor to start the next pack feed.
03	150	**"Bar Read Time" (Range: 0 > 9995, Inc: 5)** Time(msec) waiting for reader response.
04	250	**"Folder Exit Time" (Straight Conveyor Only) (Range: 0 > 9995, Inc: 5)** Time(msec) allowed for pack to reach the folder exit sensor.
05	150	**"Line Read Time" (Range: 0 > 9995, Inc: 5)** Time(msec) waiting for reader response.
06	10	**"Xcvy Dump To Acc Dump Time" (Range: 0 > 9995, Inc: 5)** Time(msec) from "Xcvy is going to move" until next Accum dump is started.
07	100	**"Xcvy Clutch On Time" (Range: 0 > 9995, Inc: 5)** Time(msec) Xcvy clutch is on adjusted for number of stations. Adjust up/down to place the last pack at the Xcvy exit.
08	300	**"Xcvy Into Station 1 Time" (Range: 0 > 9995, Inc: 5)**
09	50	**"Xcvy Outof Station 1 Time" (Range: 0 > 9995, Inc: 5)**
10	400	**"Folder Start To Conveyor Time" (Range: 0 > 9995, Inc: 5)** Should be greater than Eng Value 04, Folder Exit Time when Exit Type is Conveyor and not in test.
11	0	"**Test Console Switch" (Range: 0 > 1, Inc: 1)** 0 = turns off diagnostics only used in debug mode.
12	1	**"Language Select" (Range: 1 > 2, Inc: 1)** 1 = English. 2 = English
13	0	**"Xcvy Package InOut Counter" (Range: 0 > 9995, Inc: 5)** Max Number of packages expected in Xcvy. 0 disables this check.
14	150	**"Acc Dump Clutch On Time" (Range: 0 > 9995, Inc: 5)** Constant value Accumulator clutch is on adjusted for speed. Adjust up so pack fully exits. Adjust down if next pack is partially pulled under rollers.
15	5	**"TouchScreen X Correction" (Range: -60 > 60, Inc: 1)** Constant value for touch sensing. Adjust up to move sense right. Adjust down to move sense left.
16	-10	**"TouchScreen Y Correction" (Range: -60 > 60, Inc: 1)** Constant value for touch sensing. Adjust down to move sense up. Adjust up to move sense down
17	20000	**"Paper Demand Time" (Range: 0 > 60000, Inc: 500)** Time(msec) waiting for paper stack switch in feeder to be satisfied by infeed.

Number	Value	Description
18	3	**"Max Xcvy Stations" (Range: 2 > 6, Inc: 1)** Max Number of package positions in Xcvy "2-6".
19	0	**"Test ExitComm Test List Switch" (Range: 0 > 255, Inc: 1)** 0 = No extra ExitComm (Comm3) list messages. 1 = Extra ExitComm list messages, times in msec, Demand time, receive character (for Sure-Feed). Bit level assignment: (D7 D6 D5 D4 D3 D2 D1 D0. D7 > D1 = unassigned D0 = ExitComm messages
20	0	**"Exit Demand Switch" (Range: 0 > 1, Inc: 1)** Applies to Hopper Fill and Conveyor. 0 = No Exit Demand required. 1 = Exit Demand required (for Conveyor for Sure-Feed).
21	215	**"Exit Demand Time Out" (Range: 0 > 999, Inc: 1)** Default 60 = 60 seconds to shut down on no demand. Range 0 to 999 seconds.
22	3000	**"Xcvy Jam At Out Time" (Range: 0 > 9000, Inc: 10)** Default 3000 = 3000 msec to pass pack through exit sensor. Range 0 to 9000 msec.
23	350	**"Xcvy Jam At In Time" (Range: 0 > 9000, Inc: 10)** Default 500 = 500 msec to pass from folder to in sensor. Range 0 to 9000 msec.
24	250	**"Feed to Accum Time" (Range: 0 > 5000, Inc: 10)** Default 170 = 170 msec for the lead edge of paper fed at the feed sensor to the lead edge entering the accumulator. Range 0 to 5000 msec.
25	1	**"Advance Feed Switch" (Range: 0 > 1, Inc: 1)** 1=ON, allows the next pack to be started when the Accumulator is supposed to dump plus the Accumulator Dump Time. 0=OFF, starts the next pack after Accumulator Presence Sensor is cleared plus the Accumulator Dump Time. When EV #25 is set to "1", EV's #1,2,23,24 should be adjusted as close to numbers on the right of "→" to obtain optimal performance. These values may vary depending on type and weight of paper being processed, environmental conditions, and system tolerances.
26	1	**"Comm Hardware Type" (Range: 0 > 1, Inc: 1)** 0 = Ziatech, 1 = WinSystems.
27	4444	**"Eng Values Password" (Range: 0 > 9999, Inc: 1)** 4444 = Default(9561 is backup).
28	1	**"Eng Values Enable Password" (Range: 0 > 1, Inc: 1)** 1 = Enable(Default), 0 = Disable. This enables or disables password to access Engineering Values.
29	3	**"Max. Exit Demand power On Cycles" (Range:0 > 99, Inc: 1)** 3 = Default. Number of inserter demand cycles before 438 outputs a package.
30	2	**"Bar Read Commport" (Cycle Machine Power) (Range: 1 > 2, Inc: 1)** 1 = Commport on CPU-PCB. 2 = (Default) Commport on Serial Expansion PCB.
31	700	**"System ON/OFF Time Cycles". (Range: 500 > 700, Inc: 5)** 700 = Default. Debounce time in msec to acknowledge cycling of POWER ON Button Presses from OFF to ON, ON to OFF.
32	100	**"Straight Conveyor Table ON Time" (Range: 5 > 500, Inc: 5)** Default – 100. Time in milliseconds for conveyor table ON time for each pack out of folder.
33	2	**"Number of Double Detect Sample Counts" (Range: 1 > 4, Inc: 1)** Default = 2. Number of Double Detect Sample Counts per sheet fed. 20msec sample rate.
34	0	**"This EV intentionally left blank" (Range: 0 > 1, Inc: 1)** (Maximum Sheets Allowed to Accumulate moved to "Accumulator Setup" in version 26412.051).

Number	Value	Description
35	80	**"Feed Control Brake Delay Time" (Range: 0 > 160, Inc: 10)** Default = 130 msec. Allows the page trail to leave the singulator before the feed brake is applied. Delay calculation based on sheet length, speed, and this constant.
36	100	**"Exit Comm Recvd Ack Time" (Range: 0 > 500, Inc: 10)** Default = 100msec. In Tampa 1 only, if no Ack Response is received the machine errors out and resets the comm. To try transmit again. (See EV#37 for retries.) If set to =0 there is no Exit Comm Rcvd Ack Timer check and no machine error
37	0	**"Exit comm. Xmit Retries" (Range: 0 > 2, Inc: 1)** 1 + Default. In Tampa 1 only, if no Ack Response is received defined in EV#36, a retry is initiated and sends a duplicate serial string. A range of 0->2 retries can be indicated before the machine stops and displays the error: "Exit Comm: No Message Response (E20801)". (See EV#36 for time setting). If set to =0, no retries are initiated and if an Ack Response is not received in the allotted time (EV#36), an error is generated.
38	2	**"Barcode Reader (1=AS 30+, 2=MS911. 3=DL2031)" (Range: 1 > 3, Inc: 1)** Default = 2. Will select the Start and Stop protocol for either an Accusort Model 30+ or a microscan MS911. 1 = Accusort Model 30+ Bar Read Start Serial Trigger = "S" Bar Read End Serial Trigger = "E" 2 = (Default) Microscan MS911 Bar Read Start Serial Trigger = "<S>" Bar Read End Serial Trigger = "<J>" 3 = DataLogic 2031 Bar Read Start Serial Trigger = "S" Bar Read End Serial Trigger = "E"
39	0	**"Bad pack, Retain Selects? (1=Yes, 0+no)" (Range: 0 > 1, Inc: 1), Default = 0)** 0 = Default. Normal operation. Upon Bad Pack, select and evelope bits are set to zero. 1 = Upon Bad Pack, select and envelope bits are retained.

Number	Value	Description
40	1	**"Electronics? (1 = New, 0 = Old)" (Range: 0 > 1, Inc: 1, Default = 1)** 1 = Default. Enables I/O configuration for new modular electronics. 0 = Enables I/O for classic 420 two rack electronics.
41	0	**"Sequential Stop Cycles (0=Off)" (Range: 0 > 99, Inc: 1, Default = 0)** 0 = Default. Normal operation. 1 – 99 = Demand cycles after package leaves transfer conveyor that I/O point 0:16 "Inserter Stop" is asserted upon the occurrence of a Sequential Stop command.
42	70	**"Max. pages in track 1 – 200" (Range: 1 > 200, Inc: 1, Default = 70)** Used with Flat Feeder configuration. Limits maximum pages that can be accumulated in a track section.
43	0	**"Feed Sensor interrupt (1=ON, 0+OFF)" (Range: 0 > 1, Inc: 1, Default = 0)** 0 = Default. Utilizes poling method for input. 1 = Utilizes interrupt method for input.
44	1	**"Accum Pack Bad: Set Pack After Bad Also" (Range:0 > 1, Inc:1, Default = 1)** 1 = Default. Upon occurrence of a bad pack, the next pack processed is tagged as bad also until a good pack is processed. 0 = Next pack, if no error in normal processing, is not tagged as a bad pack.
45	1	**"Accum Pack has Single: Set Pack Bad" (Range: 0 > 1, Inc:1, Default = 1)** 1 = Default. Upon a single cycle accumulation of a pack in the accumulator, the pack processed is tagged as bad. 0 = pack is not tagged as a bad pack.

Number	Value	Description
46	1	**"Accum Pack Bad: Set Previous Pack Bad Also" (Range: 0 > 1, Inc: 1, Default = 1)** 1 = Default. Upon occurrence of a bad pack, the previous pack processed is tagged as bad pack also. (pack in Xfer conveyor). 0 = Previous pack, if no error in normal processing, is not tagged as a bad pack.
47	0	**"Flap Detect IO Inversion (1=Invert, 0+Normal)" (Range: 0 > 1, Inc:1, Default = 0)** 0 = Default. Normal operation. 1 = Logic inversion for the signal. (Incserco mailcrafter).
48	0	**"Intrack Sns Method (0=Normal, 1=Subset-pause)" (Range: 0 > 1, Inc: 1, Default = 0)** 0 = Default. Normal operation. 1 = Support for Subset-Pause operation utilizing both Transfer Conveyor out Sensor and Intrack/Open Feed Sensor to track folded subsets in same track.
49	0	**"Accum pack Bad: Set Divert By Read Bit" (Range: 0 > 1, Inc:1, Default = 0)** 0 = Default. Normal operation. 1 = Sets Divert by Read bit if the pack is not valid.
50	0	**"ReadLess Read Mode" (Range: 0 > 1, Inc: 1, Default = 0)** 0 = Default. Normal operation. 1 = Special error recovery routine when using Demand Feed type "Read first" in barcode for FPF-35.
51	1	**"First pack Dumped Error Enable" (Range: 0 > 1, Inc: 1, Default = 1)** 1 = Default. Normal operation. 0 = Disables setting bad pack on first pack processed after startup or purge.
52	1	**"Feed & Accum pack Error Enable" (Range: 0 > 1, Inc:1,Default = 1)** 1 = Default. Normal operation. 0 = Disable setting bad pack on Feeder or Accum. Errors.

Number	Value	Description
53	0	**"Inserter Error Pause mode Switch" (Range: 0 > 7, Inc: 1, Default = 0)** 0 = Default. Normal operation 1 = Pulse I/O (1:16) upon a read or processing error. 2 = Pulse I/O (1:16) upon a Demand Feed occurrence while accumulating a package. 3 = combines functions 1 & 2 4 = Steady state on I/O (1:16) upon a Demand Feed occurrence while accumulating a package. 5 = combines functions 1 & 4 6 = Illegal combination. 7 = Illegal combination.

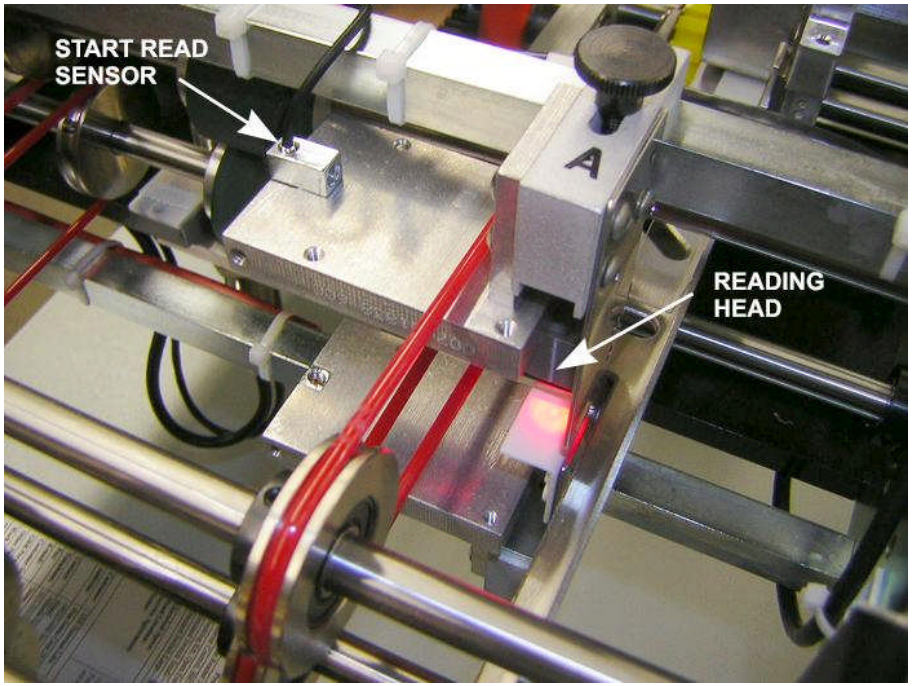
A.9 LINE CODE READ SYSTEMS OPTION

A.9a Introduction

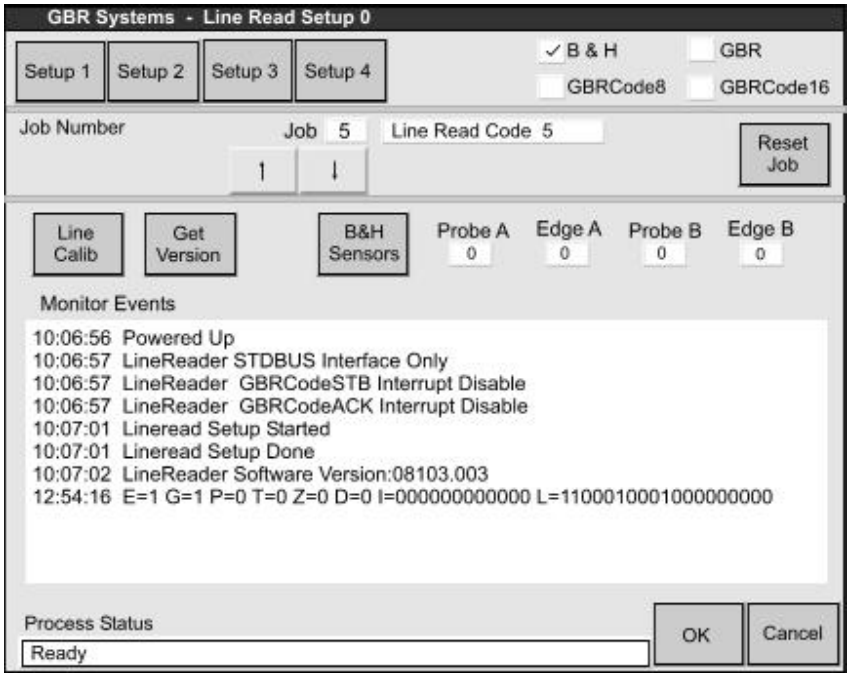
The Line Code Recognition System is capable of decoding line code marks that are on 1/10”, 1/8" or 1/6" spacing. There can be as many as 25 mark locations in a bank with a possibility of two banks per each channel of Line Code marks.

A Single Line Code Recognition card supports input information from two probes. The second probe is a optional feature. The system is limited to having only one of the two probes active at any one time. If more than one channel of Line Code marks is required to be recognized on a single document, each additional channel requires another Line Code Recognition system.

Read Probe Assembly



A.9b 438 Line Read Setup Screens (GBR & B+H)



Line Read Setup 0

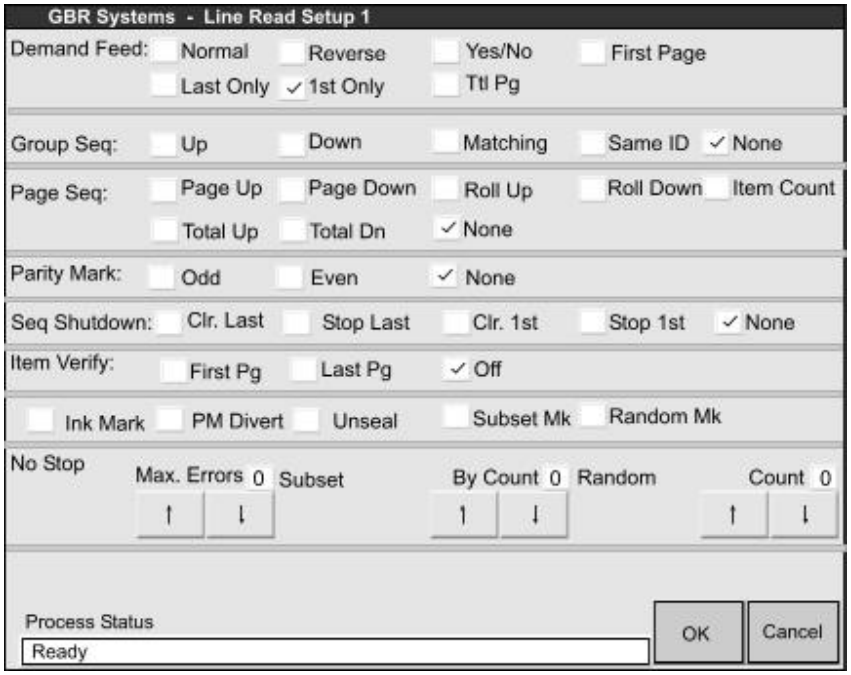
Select the type of Line Code to be read

- B&H GBR GBRCode8 GBRCode16

Select the Job by paging through the Job Numbers and picking a previous job or enter a new job.

Select the desired Probe

A.9c Line Read Setup 1



Demand Feed

Normal - The machine will demand feed on the absence of an End Of Group mark. This means the only page in a set that has the mark is the last one.

Reverse - The machine will demand feed on the presence of the End Of Group mark. This means the all pages in the set will have the mark except the last one.

Yes/No - Used where all pages have a mark. Each page will have an End of Group or a NOT End Of Group mark (EOG mark missing). The machine will demand feed on EOG, but all other documents in the set should have the NOT EOG mark.

First Page – When only the first page will have an EOG mark.

Last Only - When this option is selected, the system looks for the end of group mark (demand feed) on the last page of a set to be fed into the accumulator. This option is intended for use with page sequencing configured as "page down".

GROUP SEQUENCE

UP - Choose if the group is counted UPward. (1, 2, 3, 4). Sets must be in order.

DOWN - Choose if the group is counted DOWNward. (4, 3, 2, 1). Sets must be in order.

MATCHING - will match marks within a set. All marks in the set must be the same. Sets may be in random order.

SAME ID – The group sequence is checked to be sure all pages within each pack have identical group sequence marks

NONE - No group sequence.

The purpose of the Group Seq mark is to ensure pages from two different packages do not get processed in a single package. Group Seq marks must be present when using GROUP SEQUENCING.

PAGE SEQUENCE

PAGE UP - Choose if the page is counted UP (1, 2, 3, 4).

PAGE DOWN - Choose if the page is counted DOWN (4, 3, 2, 1).

ROLL UP - Cycle counts up sequentially to a selectable value set in "Line Read Setup 3 (Group Seq and Page Seq - Min and Max)

ROLL DOWN - Cycle counts down sequentially from a selectable value set in "Line Read Setup 3 (Group Seq and Page Seq - Min and Max)

ITEM COUNT - Choose when the first sheet in a package indicates the total number of sheets in that package.

Total Up Linked to total page count, this will expect the pages to count up during each pack feed.

Total Dn Linked to total page count, this will expect the pages to count down during each pack feed.

NONE- No page sequence.

There is a limit of three Page-Sequence marks. Their purpose is to give an individual identity to each page within the package. The maximum number of pages in a package is seven. Page-Sequence marks must be present when using PAGE SEQUENCING.

Parity Mark

Odd Parity – Counts the total number of marks read. If the total is an odd number, then the parity test is passed. If the total is an even number, then an "PARITY ERROR (E18019)" is generated and the machine stops. The Parity Mark is present to always make the total odd.

Even Parity – Counts the total number of marks read. If the total is an even number, then the parity test is passed. If the total is an odd number, then an "PARITY ERROR (E18019)" is generated and the machine stops. The Parity Mark is present to always make the total even.

None – Default.

Sequence Shutdown - Explain!

- Clr. Last (Clear Last)
- Stop Last (Stop Last)
- Clr. 1st (Clear First)
- Stop 1st (Stop First)
- None

Item Verify – Explain!

- First Pg
- Last Pg
- Off

Ink Mark

- **PM Divert**
- Error! No index entries found.**Random Mark**

NO STOP MAX ERRORS

Setting “No Stop Max Errors” to “0” allows the machine to function normally and stop on a read error. Setting to “1” enables the “No Stop” function which, when a read error is encountered on a pack being accumulated, that pack, the previous pack that had been accumulated and the folded pack sitting in the first station of the transfer conveyor, will all be set as bad packs. These packs are diverted at the end of the inserter.

This use of Divert has priority over “Divert by Mark” and “Divert by Weight”.

To use this function, “Bad Pack Stop Enable” in “Inserter Setup 1” must be deselected.

Priority Levels for Pm Divert are:

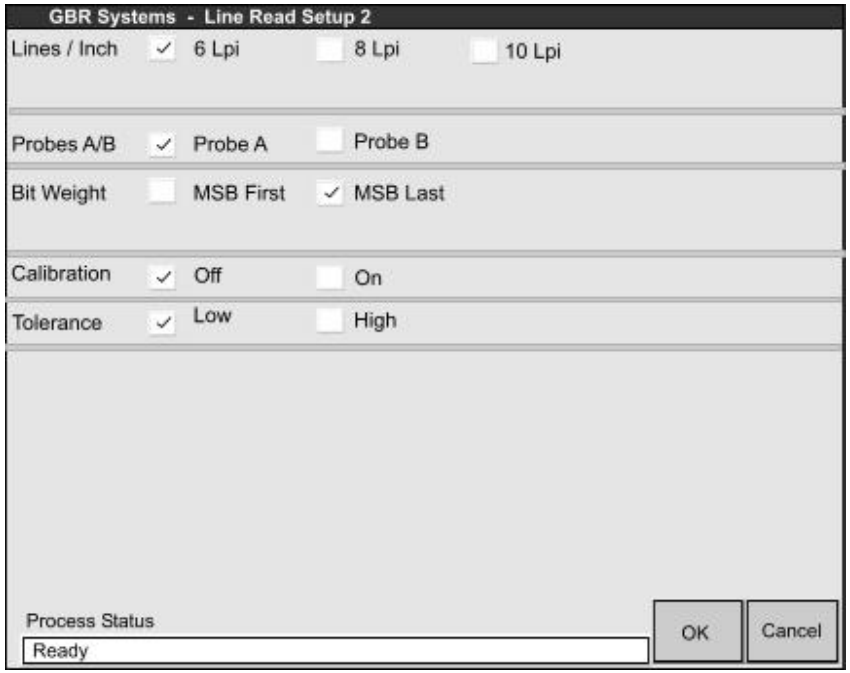
1. “No Stop” if selected in Line Read and Line Read is selected in System or, if “No Stop” is selected in Bar Read and Bar Read is selected in System. If “None” is selected for read type then “No Stop” is disabled.
2. “Meter Divert” in Line Read no matter what read type is selected.
3. By “Weight” is default.

Press “OK”

<u>IMPORTANT NOTE</u>: Press “Cancel” to void any changes made to this screen or “Ok” to set the changes and return to the “Line Read Setup 0” screen.

A.9d Line Read Setup 2

("Setup" > "Line Read" > "Setup 2")



Lines / Inch

The code marks can be at 1/6, 1/8, or 1/10 inch spacing. This is 6, 8, or 10 lines per inch. There can be as many as 25 mark locations in a bank.

EXAMPLE	
GRM	Gate Mark
EOG	End of Group
GS1	Group Seq Bit 1
GS2	Group Sea Bit 2
GS4	Group Seq Bit 4
GS8	Group Seq Bit 8
PS1	Page Seq Bit 1
PS2	Page Seq Bit 2
PS4	Page Seq Bit 4
PAR	Parity

NOTE: Presence of a bar is binary 1, and the absence of a bar is binary 0.

The GRM mark must be located in the first position. The EOG, PAR, Group Seq number, and Page Seq number marks may be shifted in the bank of marks. The Group Seq grouping and the Page Seq grouping must be located as sets, however.

Probes A/B

Select the reading probe to be used.

Bit Weight

Page and Group marks can be arranged as Most Significant Bit First (MSB) or Most Significant Bit Last.

MSB First is the first bit encountered when reading.
MSB Last is the last bit encountered when reading

Example MSB Last	Example MSB First
GRM	GRM
EOG	EOG
GS1	GS8
GS2	GS4
GS4	GS2
GS8	GS1
PS1	PS4
PS2	PS2
PS4	PS1
PAR	PAR

GBR Line Code Calibration

NOTE: Calibration is normally to be used by the service technician only. See section "GBR Line Code Read" for related information. See Line Read Setup 0, "Line Calib" for B+H Line Read calibration.

The GBR Line Code Recognition system can be calibrated to the particular machine in which it is installed. Calibrating the Line Code Recognition system to the particular machine eliminates parts tolerance problems and provides a method of recalibration once parts have become worn.

Calibration of the machine is provided for 1/10", 1/8" and 1/6" code spacing. There is a different calibration number stored in battery backed memory for each type of code spacing. This means a machine must be calibrated when the proper line code spacing is selected. Once a machine has been calibrated for 1/6", 1/8", or 1/10" spaced codes it will operate properly until the parts on the machine become severely worn.

The machine is calibrated by running a special Calibration sheet through the machine. The Calibration document has two precisely placed marks on the document. These marks provide the needed reference points to calibrate the machine. The same sheet is used for all three settings.

Description of A Calibration Document

A Calibration document has two precisely placed Line Code marks on a document. The first Line Code mark is placed one inch from the leading edge of the document. The second Line Code mark needs to be precisely placed 6 inches away from the first Line Code mark. No other marks can be in the area between the two marks. This will give the Line Code Recognition system the expected reference distance to calibrate to the machine. The Line Code Recognition card uses the two marks on the Calibration document to count the number of encoder signals that occur between the marks. If the number of encoder signals counted are within 15 % of the expected number of encoder signals, it is considered a valid calibration value.

Calibration Procedure

FOR 1/10", 1/8" AND 1/6" SPACED LINE CODES

1) Check all mechanical setups in the machine. Examples:
   - Friction feeder is free of mechanical binding
   - Singulator is adjusted properly
   - Documents are processed through machine without distorting the paper
   - All paper hold downs are set up properly
   - Paper rails are set to the proper width

2) Line Read Setup 4 and all preceding Setup 2 must be performed first.

3) Select "Calibration On".

4) Press "OK".

5) Now feed a single Calibration document on the machine.

6) If none of the following errors are declared when a calibration document is fed the Line Code Recognition system is calibrated for the current selected Line Code spacing.

   <u>Errors Indicating A Bad Calibration</u>

   - NO FEED
   - NO GATE MARK DETECTED
   - NO GATE MARK DETECTED IN 2ND BANK
   - CALIBRATION OUT OF RANGE

7) If a bad calibration is indicated RECALIBRATE must be selected before another Calibration document is fed. (Go back to step 4.)

Tolerance

Use LOW setting unless there is not a good contrast between the document background and the function marks. The LOW setting will tolerate some drift in the printer registration. Use of the HIGH setting does not allow drift in the printer registration. The mark location is very critical if the HIGH setting is used. Use it if the contrast between the document and the function marks is poor.

The Line Code Recognition system supports two print line windowing schemes when interpreting a Line Code. The two windowing schemes are High tolerance and Low tolerance reading. Having two windowing schemes permits service personnel to select the windowing scheme which is best suited for the customer's application.

When Low Tolerance read is selected the print line windowing scheme used does not detect paper slippage. This means the integrity of the Line Code information must be ensured by the data fields represented within the code.

A Low Tolerance interpretation of a line code synchronizes the print line windows on the Gate Mark. The Print lines following the Gate Mark are divided into absolute locations. When a mark is detected it is automatically associated with a Print line number. This means the Line Code Recognition system will not look for the standard tolerances applied between Line Code marks.

When High Tolerance read is selected the print line windowing scheme applies the standard tolerance specification between Line Code marks. This makes it likely for paper slippage in the machine to be detected during the interpretation of the Line Code. Detecting paper slippage improves the integrity of the Line Code Recognition process. It also introduces the possibility of more reading errors being created.

A High Tolerance interpretation of a line code synchronizes the print line windows on the Gate Mark. The Print lines following the Gate Mark are divided into zones of 1/2 print lines. Centered around the expected location of every Line Code Mark is a 1/2 print line zone where the Line Code mark is expected to be detected. Between two Line Code marks there is a 1/2 print line zone where a mark can not be detected without creating an error. This ensures that all Line Code marks are exactly where they are expected.

Press "OK"

A.9e Line Read Setup 3

(“Setup” > “Line Read” > “Setup 3”)

The reader must be told at what point in a code field it will see page, group, parity, and inserts. Depending on the code format this indicates when the field begins, how many lines it consists of, and the maximum value of the field.

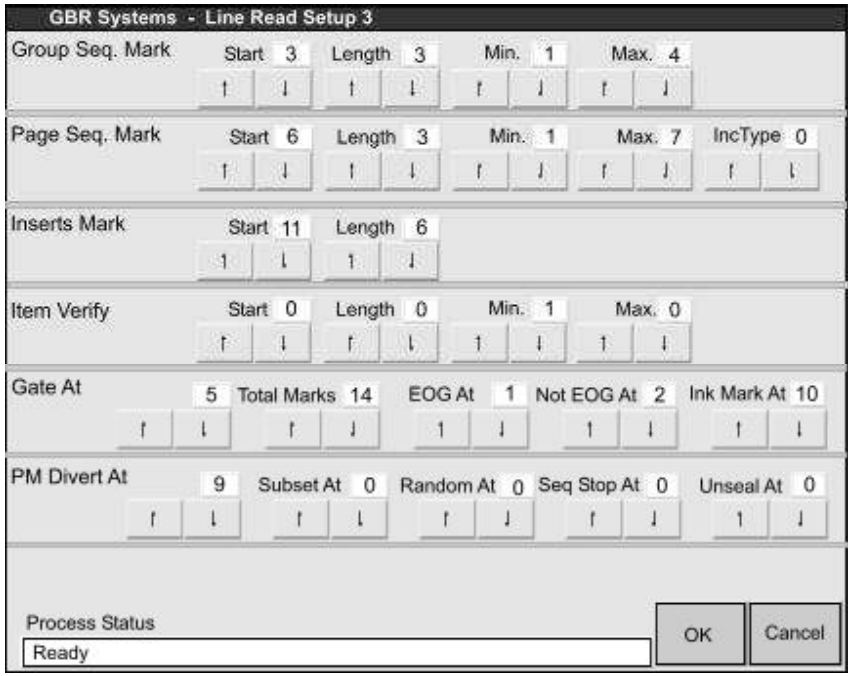
This is crucial to proper reading, and the operator should have a master code template that shows the location and value of each line in a code field. If certain fields are omitted, enter an arbitrary number not related to the specific code in that field.

Example: Where the code is page field first, and there are three lines for the page field the correct set-up would be Begin: 01 Length: 03 Max value: 7

Group Seq. Mark

Purpose - Identify each page as being a part of an individual package. The sequential incrementing of the number ensures the document’s printed sequence is maintained.

Usage - It is interpreted as a binary number. This number must be constant for all the pages within a package. This number should sequentially



increment from package to package (when sequentially counting sheets upward). This number sequentially counts from 0 to 15.

Page Seq Mark

Purpose - Identify each individual page within a package. The sequential incrementing of the number ensures the documents are assembled in the proper order.

Usage - It is interpreted as a binary number. This number sequentially counts from one to as high as seven.

Inserts Mark The length will coincide with the number of stations on the inserter, e.g. six stations = a length of six lines with each line representing a station. If the code shows a mark at one of the positions the corresponding station will feed an insert.

Gate Mark

Location - First OMR mark within a bank (always present)

Purpose - Indicates the start of an OMR code

Usage - synchronizes the OMR system to interpret the remaining OMR marks in the code.

Total Marks is the number of marks in the current line code block from gate mark to the end.

EOG At

Purpose - Controls the size of dynamic packages by indicating the end of a group.

Usage - A solid bar is placed in this location on the page with the largest page ID number. All other pages within a group should have no mark in this area.

Not EOG At is used as an added security aid. If Not EOG is checked the code block must not have a mark in this location except at the end of the group.

Ink Mark At sets the position in the code block to assign an ink mark when required

PM Divert At Postage Meter Divert is a signal provided by the computer when the postage weight of a package exceeds the limit of the postage meters on the inserter. The signal is delivered at the

Postal Meter Divert Mark

Subset At:

Seq Stop At:

Unseal At:

Parity Mark (not available at this time)

Purpose - Adds parity error checking to the code

Usage - This location is used to maintain an even number of solid marks within a code.

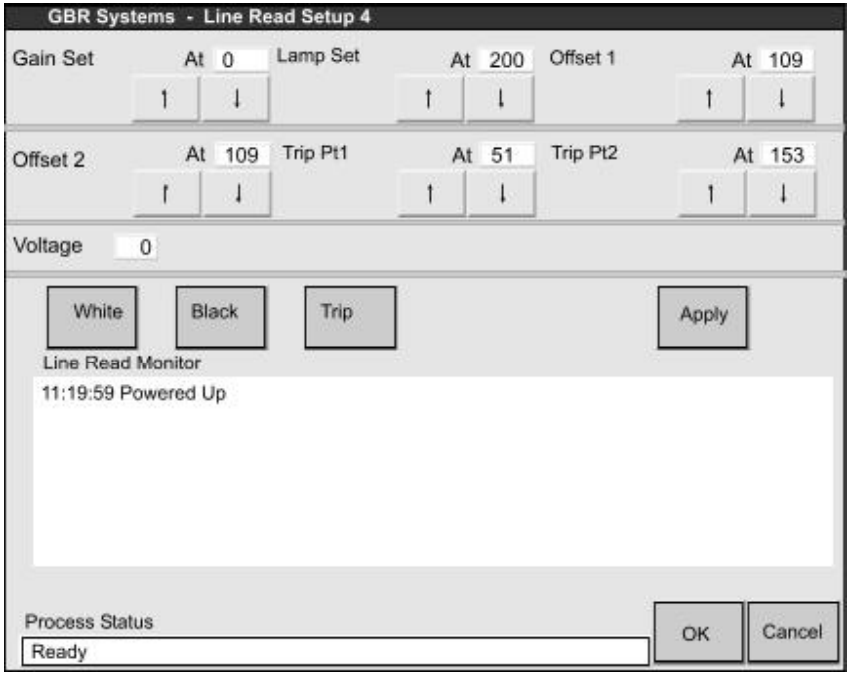
Note: The fields that are marked Optional can be eliminated by operator configuration of the machine. However, when a data field is eliminated package security and integrity suffers.

Subset Mark

Press “OK”

A.9f Line Read Setup 4

("Setup" > "Line Read" > "Setup 4")



Note: This screen is used only for B+H Line Read, not used for GBR Line Read.

1) Turn on the 438, press the SETUP button then press the LINE READ button.
2) Select "GBR".
3) Press "OK".
4) Press "LINE READ" again.
5) Press "SETUP 4".
   a) Take a piece of the stock that is going to be run through the machine and hand feed it until the light beam is on a white portion of the paper.
   b) Press "WHITE". The system will indicate that when it is done.
6) Press "BLACK" and slowly move the paper until a black bar is under the light.
7) Press "BLACK" a second time when the voltage reaches "0" (the black bar is directly under the light)
8) Remove the paper from under the light and press "TRIP".
   a) Event list will say finished when done.
      - TRIP POINT #1 value should be between 40 and 150
      - OFFSET #1 should be between 100 and 250.

If these values are not obtained, go to section A.8b and reset the probe.

9) Find the average of the recorded OFFSET #1 and #2 values.
10) Change OFFSET #1 and #2 value to this average value by pressing the + or - keys. (example: OFFSET 1 = 129, OFFSET 2= 111, average =120, set both OFFSET 1 and 2 =120)
11) Change GAIN to 0.
12) Record these settings in the area to the right. In the future this procedure can be eliminated by entering these values directly.
13) Press "APPLY" to download these parameters to the read system and then press "OK".
14) The reader setup is complete. Line Read screens "SETUP 1, 2, and 3" must be completed before running paper.

NOTE: When switching between probes or after the 438 has been switched off, it may be necessary to repeat this setup procedure.

NOTE VALUES FOR FUTURE REFERENCE

(To find the values, go to "Setup" > "Line Read" > "Setup 4" and write down the values listed there)

GAIN: _____

OFFSET #1: _____

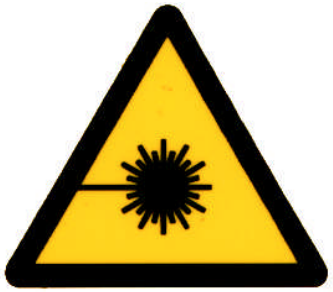
OFFSET #2: _____

TRIP POINT #1: _____

TRIP POINT #2: _____

A.10 LASER BAR CODE READ OPTION

A.10a Laser Safety



The radiation level from the laser does not constitute a health hazard. Exercise care to avoid any unnecessary, direct exposure to the eyes. Avoid staring at the light source, since prolonged exposure could result in eye damage. Avoid deliberate eye exposure to the beam. Inadvertent contact, however, is not a cause for alarm.

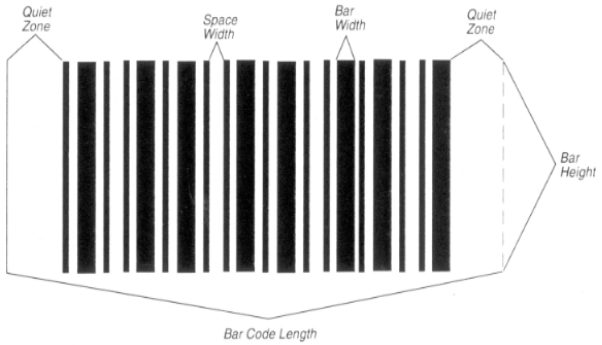
Any service should be performed so as not to violate compliance with the Code of Federal Regulations, Title 21. Part 1040, Section 10 (21 CFR 1040.10), as administered by the Center for Devices and Radiological Health, a service of the Food and Drug Administration under the Department of Health and Human Services. Do not attempt to defeat any safety provisions.

A.10b Bar Code Basics

A bar code is a group of rectangular bars and spaces arranged in a preset pattern. The pattern is organized to represent elements of data referred to as characters. The standard industry codes can represent several alphanumeric characters.

There are many different types of bar codes. Each type uses its own symbology, which defines how the bars and spaces represent the letters and numbers.

The figure below shows each part of a bar code. The labels for each part remain the same even if the position, orientation, or type of bar code changes.



The GBR 438 with the Microscan MS-911 uses the 3 of 9 code or Code 39 - fixed or variable length. This was the first code developed that used both numbers and upper-case letters. It is the most recognized and widely used for non-retail applications. Each character is represented by a stand-alone group of 5 bars and 4 spaces. The basic code set includes 0-9, A-Z, * which is used for the start and stop characters, and six other symbols - . $ / + and % for a total of 43 characters. Because each of the characters are discrete and self-checking, Code 39 provides a high level of data security. The Microscan MS-911 automatically checks all data for this symbology.

The bar code width must not be printed smaller than 0.010" (.025 mm). Recommended width is 0.015", code height is 3/8 inch. Minimum quiet zone start and end of .25 inches.

Bar coding, sizing, tolerance ratio tolerance per ANSI MH10.8-1983. Print quality must meet or exceed ANSI Grade B per ANSI X3.182, BAR CODE PRINT QUALITY GUIDELINE.

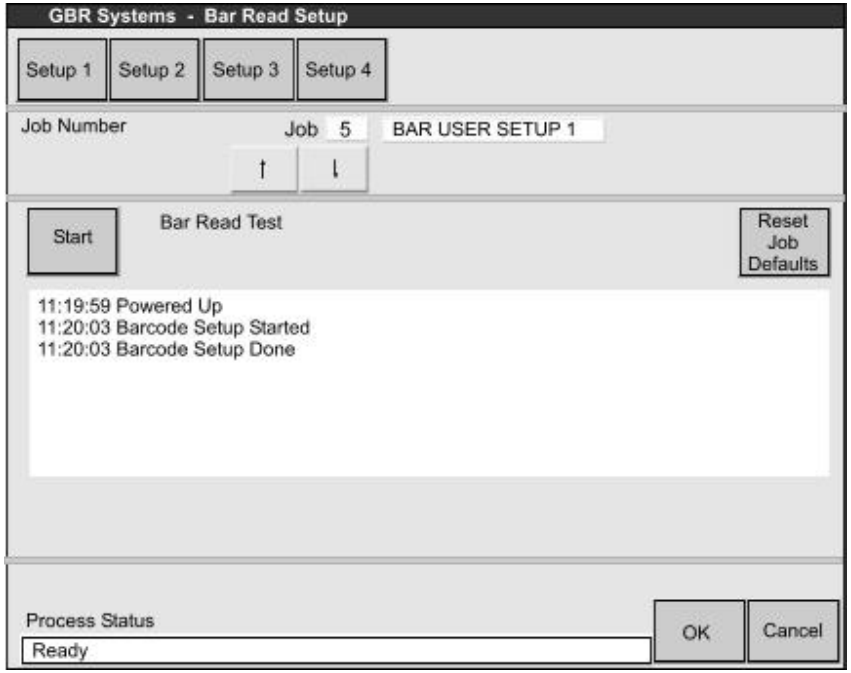
A.10c Adjusting Your Microscan MS-911

Your scanner can be mounted in any direction depending on the scheme of your bar codes. **Ladder** orientation refers to a bar code whose bars look like a ladder when facing the bar code's direction of travel. **Picket Fence** appear as a picket fence when facing the direction of travel. Regardless of the direction of travel, the scan line must be perpendicular to the bars.

In some applications, codes are printed on glossy paper or covered with a shiny material such as cellophane. When this happens, it is possible that the code surface reflects so much laser light that it is very difficult for the scan head to decode the bar code.

To avoid reflections from the surface of glossy bar codes do not mount the scan head parallel with the object to be scanned. Mount the scan head at a five to ten degree angle so the laser beam reaches the bar code at a slight angle.

A.10d Setting the 438 to Read Laser Bar Code



"Setup" > "Bar Read"
Modifications to the bar setups are retained as long as the bar job defaults are not restored or the internal non-volatile storage is not overwritten by a new 'ini' file or is lost.

SETUP 1

SETUP 2

SETUP 3

SETUP 4

Job

Select the job to run by pressing "↑" or "↓".

Note: If your job is not listed, go the next section "Setup 1" to program it in. Refer to the Appendix in this manual for setup parameters for various jobs. If your job is not listed call the factory.

Start

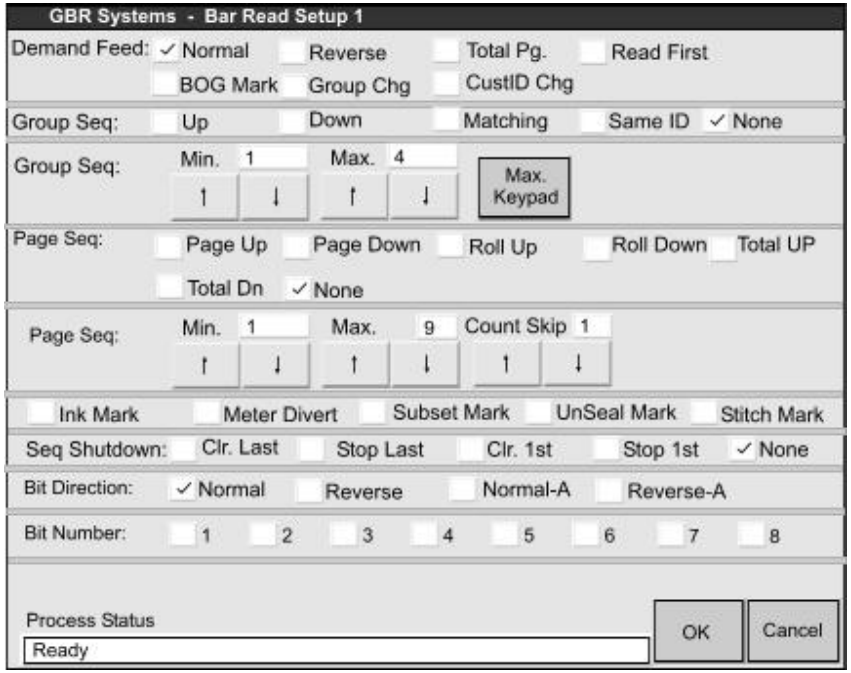
This will turn the laser on continuously to hand test the lasers positioning. The screen will read **BAR READ:** and an audible beep will sound when the laser reads the code. The results of the read will be shown on the screen.

Reset Job Defaults

Sets the bar job selected to its defaults, erasing any modifications that may have been done in the setups.

Press **OK to set the job**.

A.10e Bar Read Setup 1


GBR Systems - Bar Read Setup 1
Demand Feed: ✓ Normal Reverse Total Pg. Read First
BOG Mark Group Chg CustID Chg
Group Seq: Up Down Matching Same ID ✓ None
Group Seq: Min. 1 Max. 4
Max. Keypad
Page Seq: Page Up Page Down Roll Up Roll Down Total UP
Total Dn ✓ None
Page Seq: Min. 1 Max. 9 Count Skip 1
Ink Mark Meter Divert Subset Mark UnSeal Mark Stitch Mark
Seq Shutdown: Clr. Last Stop Last Clr. 1st Stop 1st ✓ None
Bit Direction: ✓ Normal Reverse Normal-A Reverse-A
Bit Number: 1 2 3 4 5 6 7 8
Process Status
Ready
OK
Cancel

Demand Feed

Normal

Mark is on the last page fed. Last page is "1" all others in the pack are "0".

Reverse

If checked, will handle an inverted Demand Feed sequence. Last page is "0", all others in the pack are "1".

Total Page

Each sheet has a page number and the total number of pages for it's group. Select "Total Up" or "Total Down" in Page Sequence.

Read First

The first sheet (Banner Page) of the document is read. The page count information is used to determine how many more sheets to feed and not read. After the last non-read sheet is fed, the next fed sheet will be scanned by the barcode reader to process the next document group.

BOG Mark Relates to first page hold

Group Chg Relates to first page hold

CustId Chg Relates to first page hold

Group Seq

Purpose - Identify each page as being a part of an individual package. The sequential incrementing of the number ensures the document's printed sequence is maintained.

Up – Match in set. Min to Max to Min
Down – Match in set. Max to Min to Max
Matching – Match in set. Must change each set.
Same ID – Match in set. No change needed
None
Min (0 to 1)
Max (0 to 99999)

Max Keypad may be used to set a "Max" value through a keypad instead of using the arrow scroll button.

Page Seq Purpose - Identify each individual page within a package. The sequential incrementing of the number ensures the documents are assembled in the proper order.

Page Up - Min to Max within sets.
Page Down - Max to Min within sets.
Roll Up – Min to Max to Min across sets
Roll Down – Max to Min to Max across sets
Total Up - (A-Z) Supports "Total Page" demand feed option.
Total Dn - (Z-A)
None
Min (0 to 1)
Max (0 to 999)
Count Skip

Ink Mark

Mark to drive an ink/zip marking mechanism downstream.

Meter Divert

Mark to drive a divert mechanism downstream.
Subset Mark
Unseal Mark
Stitch Mark

Seq Shutdown

Clr last

Stop Last

Clr 1st

Stop 1st

None

When a package with this bit set is accumulated, the machine stops feeding, purges the accumulator and transfer conveyor to the inserter, then powers down.

Bit Direction

Normal

Count bits 5 to 1, left to right, bit position 4 to 0, follow standard bit position of character.

Reverse

Count bits 1 to 5, left to right, bit position 4 to 0.(B&H)

Normal – A

For multiple character numeric values. For 5 numeric characters converted to a number, bit positions 16 to 1: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768.

Reverse – A

For multiple character numeric values. For 5 numeric characters converted to a number, bit positions 1 to 16: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768.

Bit Number

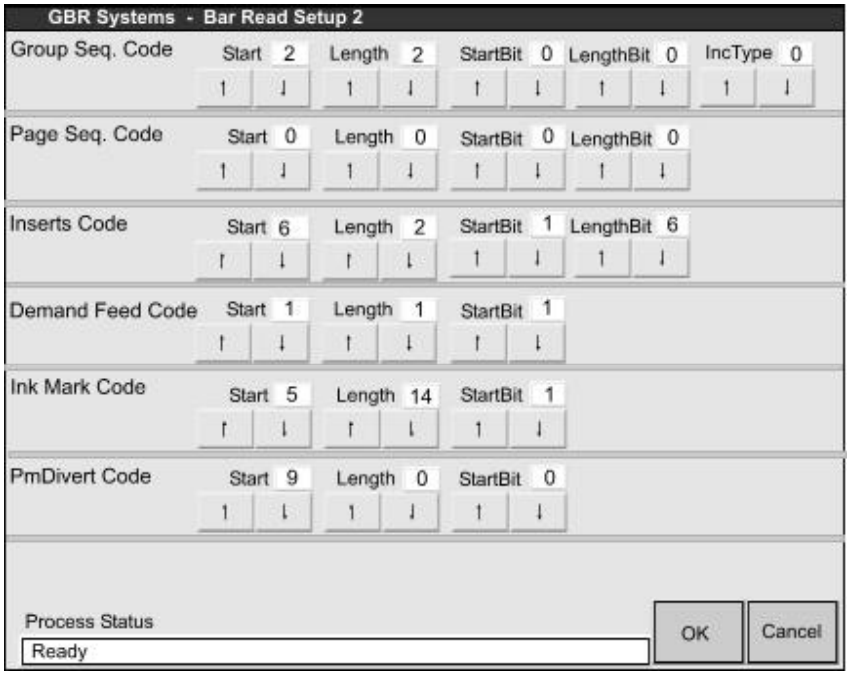
Establishes the maximum number of bits in one character. This is determined by the type of code being used.

Select from 1 through 8:

1-5 3 of 9 Bar Code

6-8 not used at this time

A.10f Bar Read Setup 2



The software permits a total of 30 characters in Bar Read, however, physically that isn't always practical due to the length of the code. For instance, 3 of 9 code is physically larger than 128 code (not available on the 438 at this time). A code in excess of 15 characters becomes problematic with a 3 of 9 code but a 128 code can easily exceed 20 characters.

Define the position in the barcode string to extract the information for the following:

Group Seq Code

Start (0 to 30). Start character.
Length (0 to 5). Number of characters.
Start_Bit (0 to 30). Starting bit position within character.
Length_Bit (0 to 30). Number of bits.
IncType – Increment Type

Page Seq Code

Start (0 to 30). Start character.
Length (0 to 3). Number of characters.
Start_Bit (0 to 30). Starting bit position within character.
Length_Bit (0 to 30). Number of bits.

Inserts Code

Start (0 to 30). Start character.
Length (0 to 20). Number of characters.
Start_Bit (0 to 30). Starting bit position within character.
Length_Bit (0 to 30). Number of bits.

Demand Feed Code

Start (0 to 30). Start character.
Length (0 to 20). Number of characters. Used with Normal-A or Reverse-A, multiple character numeric values,
Start_Bit (0 to 20). Starting bit position within character.

Ink Mark Code

Start (0 to 30). Start character.
Length (0 to 20). Number of characters. Used with Normal-A or Reverse-A, multiple character numeric values,
Start_Bit (0 to 20). Starting bit position within character.

PmDivert Code

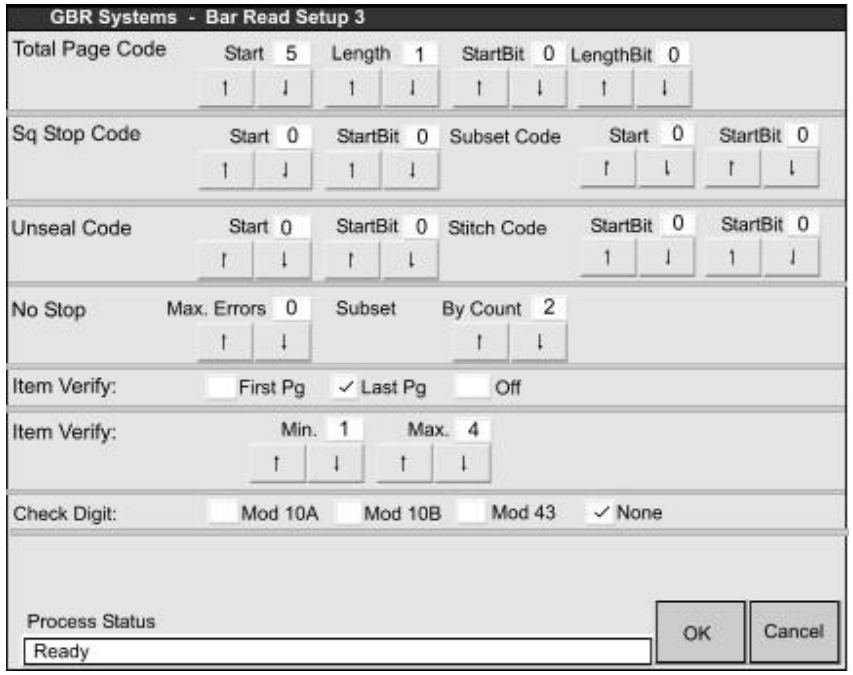
Start (0 to 30). Start character.
Length (0 to 20). Number of characters. Used with Normal-A or Reverse-A, multiple character numeric values,
Start_Bit (0 to 20). Starting bit position within character.

A.10g Adjusting the Paper Guide Belts

In order for your laser scanner to read the bar code there can be nothing blocking its path. The Paper Guide Belts are custom adjustable for your specific code location.

Place these guide belts to provide as much support evenly across the paper path as possible without interfering with the lasers view.

A.10h Bar Read Setup 3



Total Page Code

Start (0 to 30). Start character.
Length (0 to 5). Number of characters.
Start_Bit (0 to 30). Starting bit position within character.
Length_Bit (0 to 30). Number of bits.

Sq Stop Code

Start (0 to 30). Start character.
Start_Bit (0 to 20). Starting bit position within character.

Subset Code

Start
Start_bit

Unseal Code

Start
Start_Bit

Stitch Code

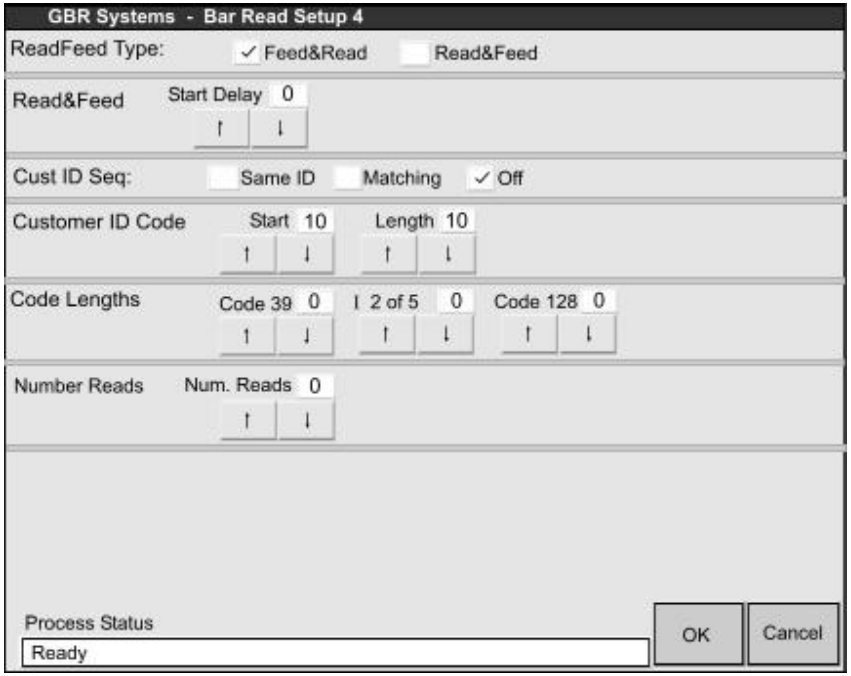
Start
Start_Bit

No Stop Max Errors

Setting "No Stop Max Errors" to "0" allows the machine to function normally and stop on a read error. Setting to "1" enables the "No Stop" function which, when a read error is detected, continues to process the job but the pack with the error is diverted at the end of the inserter. This use of Divert has priority over "Divert by Mark" and "Divert by Weight".
To use this function, "Bad Pack Stop Enable" in "Inserter Setup 1" must be deselected.

Priority Levels for Pm Divert are:

4. "No Stop" if selected in Line Read and Line Read is selected in System or, if "No Stop" is selected in Bar Read and Bar Read is selected in System. If "None" is selected for read type then "No Stop" is disabled.
5. "Meter Divert" in Line Read no matter what read type is selected.
6. By "Weight" is default.



A.10i Bar Read Setup 4

ReadFeed Type:

Feed&Read – When it is desired to Feed first and then Read (normal)

Read&Feed – When it is desired to Read before Feed (In cases where the EOG (end of group) must be known before feeding next page).

Read&Feed:

Start Delay – Only used with Read&Feed, and it is to delay the read to let the previously fed document get clear of the feeder.

Cust ID Seq:

Same ID – Code group matching between sets.

Matching – Code group matching only within a set.

Off – disables code group matching

Customer ID Code:

Start – Customer number, group ID or other number can be found beginning with this character in the Bar Code.

Length – Number of lines after the start, i.e. start=6 length=3 (From the gatemark the start is found at line 6, 7 and 8)

Code Lengths:

-1 disables reading in each category, 0 enables reading with variable length and any number indicates length, e.g. Code 39 with a length of 6 = a code block with 6 characters.

Code 39 – 3 of 9 Bar Code

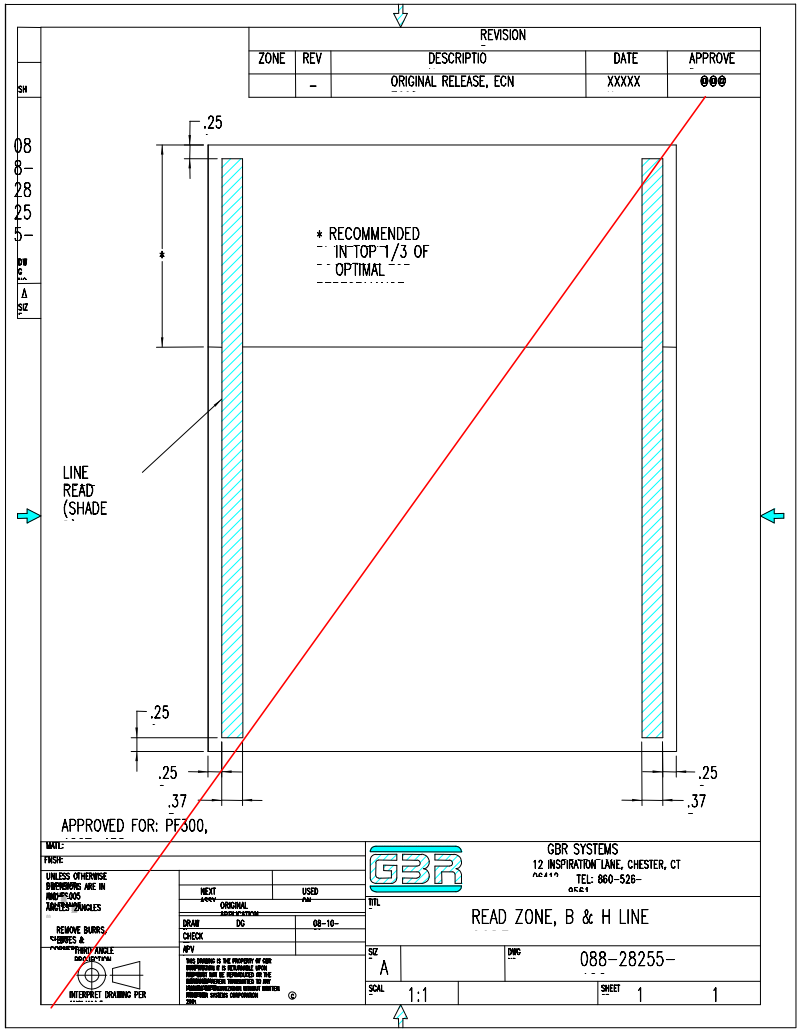
I 2 of 5 – Interleaved 2 of 5 Bar Code

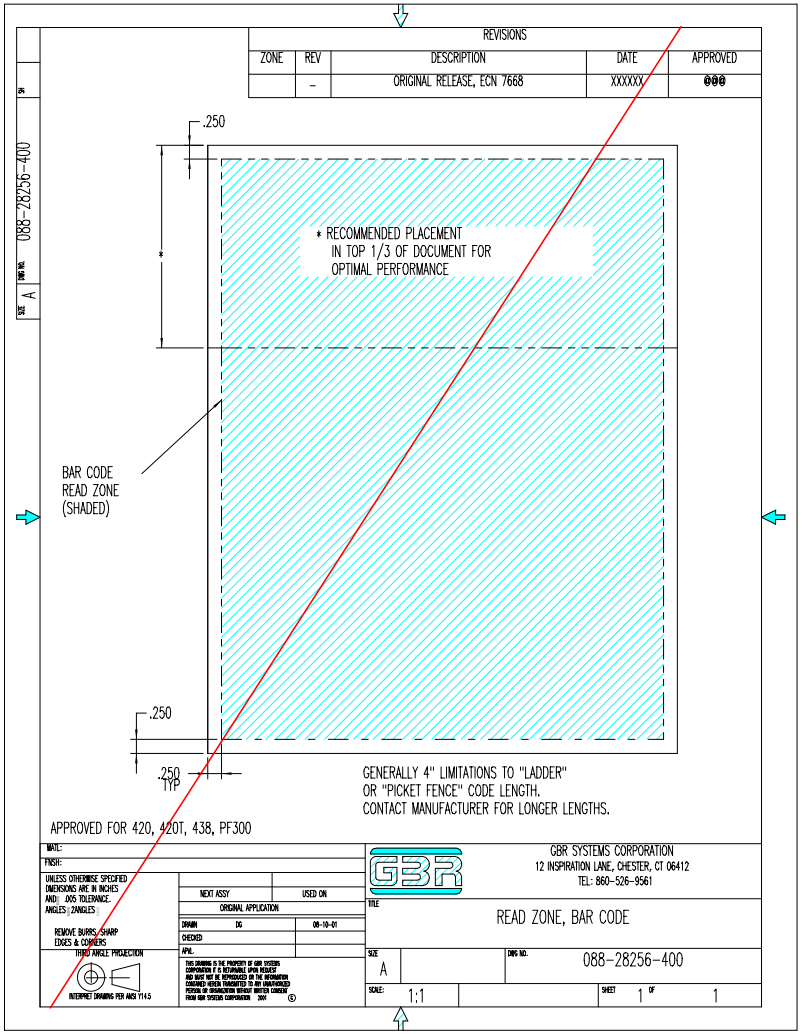
Code 128

Number Reads:

Num. Reads – the number of times the reader should scan and take average to ensure good read. (poor printing can sometimes be a reason for multiple reads)

A.12 READ ZONE DIAGRAMS





A.13 POSTAL METERING

GBR 438/420T Postal Meters and Postal Meter Weight Calculation

January 30, 2006- File:g:\iso9000\manuals - operator & service\438ab\service manual\071-XXXXX-400a (2006-04) service not released\info on postal metering on 438_420t 7-27-06.doc

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Overview

This document outlines the setup of the Postal Meters, Weight Calculation and Operation of Postal Metering on the GBR 438/420T.

Note: The order of postal meters to weight was reversed at 26412.044 on the GBR438

- GBR 420 and GBR438/420T prior to 26412.044(Aug. 2001):
  - LOW to High, Postal Meter 1 to Postal Meter 3.
- GBR438/420T after 26412.044(Aug. 2001):
  - HIGH to Low, Postal Meter 1 to Postal Meter 3 to allow Postal Meter 1, Postal Meter Divert, to divert an over weight/size package first before the meters.

Note: Revised from the GBR 438 document: n4wght1.doc.

Installation

- The Postal Meter kit uses existing Input/Output(IO) points in the GBR438 and an existing cable kit and normally operates:
  - Postal Meter Divert(Test point “Postal Meter Divert”, Rack1:Point19) is Postal Meter 1(PM1).
  - Select Station 7(Test point “Separation Sol #7”, Rack1:Point4) is Postal Meter 2(PM2).
  - Select Station 8(Test point “Separation Sol #8”, Rack1:Point6) is Postal Meter 3(PM3).
  - If you use Stations 7 and 8, there are alternate IO points that can be used, call the factory.
- In general the Postal Meters are driven by 24VDC, 3AMP output modules. 24VDC power generally comes from the inserter, but may come from the GBR438. If there are two power supplies, care must be taken not to cross connect them.
- General installations use 1 or 2 postal meters and we normally use GBR438 postal meter 2 and 3 leaving postal meter 1, Postal Meter Divert, to be used as postal meter or a oversize divert station.
- The actual order of the meters after the end of the Inserter should be Hi to Lo weight, PM1, PM2, PM3.
- The Postal Meters must be positioned after the last index position of the Inserter and all meters must be stacked as close as possible together.

Operation

- The GBR438 tracks the pack only to the last index position of the inserter. The GBR438 actually disables the meters which are not to be used leaving the one meter enabled to meter the pack.
- The GBR438 uses the inserter degree encoder to provide “fine timing” by degrees of the disable/enable signal to the Postal Meters.
- The “ON At” degree must come AFTER the Logical Shift (90 Deg.) of the pack data in the GBR438 inserter software module. The “OFF At” degree must come BEFORE the next Logical Shift (90 Deg.) of the pack data in the GBR438 inserter software module. This cycle should occur between 100 and 80 degrees.
- Only one pack can traverse the meters at any time.

Setups

Lineread, Barread Setup:
Postal Meter Divert Enable (Postal Meter 1).

- Select Postal Meter Divert Enable “ON”, to operate from a read mark ONLY.
- Select Postal Meter Divert Enable “OFF”, to operate from Weights ONLY.

Inserter Setup:

Postal Meter By Weight Enable
Check ON to enable Postal Meters

Inserter Setup 2:
Postal Meter Divert (Postal Meter 1)

- Enter Meter “ON AT:’ in degrees, 0 to 350. After 90 degrees.
- Enter Meter “OFF AT:’ in degrees, 0 to 350. Before 90 degrees.
- Enter Meter Position ‘STA:
  - 1 to 12 after envelope insert station.
  - ‘0’ to disable this meter.
- Enter Point Option ‘PT:’
  - 9 = Postal Meter Divert - DEFAULT
  - 10 = Postal Meter Divert - Inverted Signal

Inserter Setup 3:
Postal Meter 2

- Enter Meter “ON AT:’ in degrees, 0 to 350. After 90 degrees.
- Enter Meter “OFF AT:’ in degrees, 0 to 350. Before 90 degrees.
- Enter Meter Position ‘STA:
  - 1 to 12 after envelope insert station.
  - ‘0’ to disable this meter.
- Enter Meter Output Point Option ‘PT:’
  - 1 = Station 7 Select - DEFAULT
  - 2 = Station 8 Select
  - 3 = Inserter E-Stop
  - 4 = Station 1 Error
  - 5 = Station 7 Select - Inverted Signal
  - 6 = Station 8 Select - Inverted Signal
  - 7 = Inserter E-Stop - Inverted Signal
  - 8 = Station 1 Error - Inverted Signal
  - 9 = Postal Meter Divert. DO NOT USE.
  - 10 = Inverted Postal Meter Divert. DO NOT USE.
  - 11 = Moistener
  - 12 = Moistener - Inverted

Postal Meter 3

- Enter Meter “ON AT:’ in degrees, 0 to 350. After 90 degrees.
- Enter Meter “OFF AT:’ in degrees, 0 to 350. Before 90 degrees.
- Enter Meter Position ‘STA:
  - 1 to 12 after envelope insert station.
  - ‘0’ to disable this meter.
- Enter Meter Output Point Option ‘PT:’
  - 1 = Station 7 Select
  - 2 = Station 8 Select - DEFAULT
  - 3 = Inserter E-Stop
  - 4 = Station 1 Error
  - 5 = Station 7 Select - Inverted Signal
  - 6 = Station 8 Select - Inverted Signal
  - 7 = Inserter E-Stop - Inverted Signal
  - 8 = Station 1 Error - Inverted Signal
  - 9 = Postal Meter Divert. DO NOT USE.
  - 10 = Inverted Postal Meter Divert. DO NOT USE.
  - 11 = Moistener
  - 12 = Moistener - Inverted

Postal Meter Weights

- Meter 1 to 2 Weight Value(00000 to 60000)
- Meter 2 to 3 Weight Value(00000 to 60000)

Weight Page and Envelope

- Enter Page Weight Value(00000 to 60000)
- Enter Envelope Weight Value(00000 to 60000)

Weight Inserts 1 2 3 4

- Enter Insert >1 Weight Value(00000 to 60000)
- Enter Insert >2 Weight Value(00000 to 60000)
- Enter Insert >3 Weight Value(00000 to 60000)
- Enter Insert >4 Weight Value(00000 to 60000)

Weight Inserts 5 6 7 8

- Enter Insert >5 Weight Value(00000 to 60000)
- Enter Insert >6 Weight Value(00000 to 60000)
- Enter Insert >7 Weight Value(00000 to 60000)
- Enter Insert >8 Weight Value(00000 to 60000)

Weight Calculation

Postal Meter Selection Calculation. Done when pack is transferred to the Inserter.

Package Weight = Envelope Weight + (No. Pages * Page Weight) + (Insert1 * Insert1 Weight)
+ (Insert2 * Insert2 Weight) + . . . through 8 inserts.

If Package Weight is greater than or equal (>=) to Meter 1 to 2 Weight Break Value

- Then Meter 1 operates.

If Package Weight I less than (<) Meter 1 to 2 Weight Break Value and greater than or equal (>=) to Meter 2 to 3 Weight Break Value

- Then Meter 2 operates.

If Package Weight less than (<) Meter 2 to 3 Weight Break Value (and less than (<) Meter 1 to 2 Weight Break Value)

- Then Meter 3 operates.

A.13a Three Meter Example

Meter 1 to 2 Weight Break Value = 30
Meter 2 to 3 Weight Break Value = 20

Package Weight	Meter 1	Meter 2	Meter 3
X			
X			
X			
X			
X			
X			
35		X	

Three Meter Setup

Lineread Setup:

- Select Postal Meter Divert Enable “OFF”, to operate from Weights ONLY.

Inserter Setup:

- Postal Meter By Weight: Check ON to enable Postal Meters.

Inserter Setup 2:

- Postal Meter Divert(Postal Meter 1)
  - Meter “ON AT:’ in degrees.
  - Meter “OFF AT:’ in degrees.
  - Meter Position ‘STA:’ (6 stations after envelope insert station).
  - Enter Point Option ‘PT:’ (9 = Postal Meter Divert)

Inserter Setup 3:

- **Postal Meter 2**
  - Meter “ON AT:’ in degrees.
  - Meter “OFF AT:’ in degrees.
  - Meter Position ‘STA:’ (6 stations after envelope insert station).
  - Enter Point Option ‘PT:’ (1 = Select Station 7)
- **Postal Meter 3**
  - Meter “ON AT:’ in degrees.
  - 10. Meter “OFF AT:’ in degrees.
  - 6. Meter Position ‘STA:’ (6 stations after envelope insert station).
  - 2. Enter Point Option ‘PT:’ (2 = Select Station 8)
- Postal Meter Weights
  - 30. Meter 1 to 2 Weight Value.
  - 20. Meter 2 to 3 Weight Value.

A.13b Two Meter Example

Meter 1 to 2 Weight Break Value = 99. Must be greater than any pack expected.
Meter 2 to 3 Weight Break Value = 20

Package Weight	Meter 2	Meter 3
6		X
11		X
19		X
20	X	
26	X	
31	X	

Three Meter Setup

Lineread Setup:

- Select Postal Meter Divert Enable “OFF”, to operate from Weights ONLY.

Inserter Setup:

- Postal Meter By Weight: Check ON to enable Postal Meters.

Inserter Setup 2:

- Postal Meter Divert(Postal Meter 1)
  - Meter “ON AT:’ in degrees.
  - Meter “OFF AT:’ in degrees.
  - Meter Position ‘STA:’ (0 disabled).
  - 9. Enter Point Option ‘PT:’ (9 = Postal Meter Divert)

Inserter Setup 3:

- **Postal Meter 2**
  - 200. Meter “ON AT:’ in degrees.

- 10. Meter “OFF AT:’ in degrees.
- 6. Meter Position ‘STA:’ (6 stations after envelope insert station).
- 1. Enter Point Option ‘PT:’ (1 = Select Station 7)

- **Postal Meter 3**
  - 240. Meter “ON AT:’ in degrees.
  - 60. Meter “OFF AT:’ in degrees.
  - 6. Meter Position ‘STA:’ (6 stations after envelope insert station).
  - 2. Enter Point Option ‘PT:’ (2 = Select Station 8)
- **Postal Meter Weights**
  - 99. Meter 1 to 2 Weight Value.
  - 20. Meter 2 to 3 Weight Value.
  -

Notes:

- Weight Values are 5 digit numbers of arbitrary dimension. Be consistent, use tens or hundreds of an ounce (or gram) for all values. The maximum allowable internally computed package (pages + envelope + inserts) total value is 64000.

- Meter Output Point Option selection locks out standard operation of the output selected, i.e. ‘Station 7 Select’ selection does not allow standard Inserter Station 7 select through reading. Choose another Meter Output Point to resolve conflicts with actual installations.

- All meters are positioned at the same Station. This is the station after the last index track station of the inserter. The number is counted from the Envelope Insert Station of the inserter.

- Factory testing has shown that the pack moves out of the last index track station between 200 and 350 degrees. Meter enable imprint is timing is based on the ‘ON AT’ degree for each meter. The first meter in line tested at 200 degrees. The second meter inline required some delay and was tested at 240 degrees. At higher speeds, packs imprinted with the first meter inline were mistakenly being imprinted by the second meter inline unless its ‘ON AT’ degree was slightly delayed.

A.14 SOFTWARE UPDATES VIA EMAIL

The disk for this product is specifically bootable on the 438. This boot software is not normally visible and cannot be copied from one disk to another. The entire disk must be ‘disk copied’ or ‘copy disked’.

The application software (‘GBR420.exe’) is visible and can be copied to and from an e-mail, another disk or from the hard disk of a computer.

PROCESS:

1. Attached to the New438/426/420T is a new revision ‘GBR420.exe’. Save this and any other files to your hard disk in a unique folder (such as: \gbr\29101005\ where 29101 is the part number and 005 is the current engineering revision number).
2. Make a disk copy of your current master. In Windows Explorer or My Computer, right click on the 3 ½” Floppy A: and Copy disk…your current master to a new 3 ½” disk.
3. Copy the new e-mailed software revision executable, GBR420.exe to the new disk from step 2. Overwrite the previous revision. Copy any other files sent, such as the dictionary (msgs420.dat) to the appropriate place on the new disk (such as: \gbr\msgs420.dat). This is the new master for the new revision.
4. Make a disk copy of this new master to another 3 ½” disk. Use this copy as the machine boot-disk.

SECTION B - PREVENTIVE MAINTENANCE

B.1 Test equipment and tools **1**

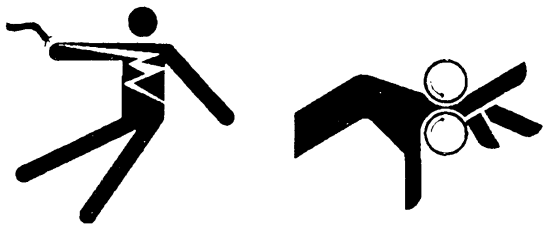
B.2 General procedures **1**
B2.a CLEANING THE MACHINE 1
B2.b LUBRICATION 2

B.1 TEST EQUIPMENT AND TOOLS

- Fluke Scope Meter
- Standard & Metric Hex Wrenches
- Small Blade Flat Screwdriver
- Philips Head Screwdriver

B.2 GENERAL PROCEDURES

WARNING!



DO NOT ATTEMPT TO CLEAN THE 438A WHEN THE MACHINE IS RUNNING. ATTEMPTING TO DO SO COULD RESULT IN INJURY. BE SURE THAT MACHINE POWER IS OFF AT ALL TIMES WHEN CLEANING.

B2.a CLEANING THE MACHINE

The 438 should be cleaned daily to remove any dirt or dust that may interfere with the operation of the machine. Paper dust collected in motion areas could impede and/or damage integral parts of the folder. Paper dust can also obscure the read image reducing a quality read if it accumulates on the read head. Excess dirt or toner build-up (from laser printing) on the feed belts could result in damage or marking to the material and/or premature wear of the feed belts. Therefore, it is important to perform the following daily cleaning instructions:

1. Clean ALL Feed Belts.
2. Remove ALL Paper Dust by vacuuming using a small clean paint brush is most effective. Using compressed air to clean the machine may drive the accumulated dust into hidden areas of the machine that are not easily accessible resulting in increased wear and wicking of vital lubricants.
3. Clean the Fold Rollers
4. Clean the Machine Cabinets and Covers.

B2.a1 Cleaning the Fold Rollers

All accumulated paper dust should either be brushed or vacuumed from the 438. Clean all accumulated paper dust from the electronic paper sensors.

B2.a2 Cleaning the Fold Rollers

DO NOT USE ANY LIQUID ON THE FOLD ROLLERS! The fold plates must be removed in order to clean all fold rollers. Please use extreme caution when removing the fold plates. They are heavy and expensive to replace.

B2.a3 Machine Cabinets and Covers

Clean the machine cabinets and covers using a soft damp cloth.

B2.a4 Paper Hopper

The feed belt should be cleaned with a fluid such as isopropyl alcohol that does not leave a film. Apply some alcohol to a rag then lightly rub all dirt and film off the belts.

B2.a5 Singulator

The Singulator must be as clean as possible at all times to insure the proper feeding and singulation of paper by the feed belt. This may be done first making sure that the singulator is not worn. If so, loosen the small set screw on the operator side and rotate the roller to a point where a rounded spot on the roller will contact the paper.
NOTE: If there flats completely around the roller and no rounded spot available, the singulator roller should be replaced as soon as possible.

Once this is accomplished, raise the singulator roller approximately 3/4" from present setting. Pass an alcohol dampened rag under the bottom of the singulator roller. Be sure that it is making sufficient contact to clean away all dirt and debris from the contact portion of the singulator roller.

B2.b LUBRICATION

No lubrication is required on the 438.

NOTE: If a mechanical component is out of line or deformed, a small amount of oil may be used as a short term fix (to eliminate noise or binding) until the component can be replaced.

SECTION C – ELECTRONICS

SECTION C – ELECTRONICS..... 1

C.1 LEFT SIDE VIEW, MAIN CABINET ELECTRONICS (CABINET ASS'Y - 005-28579-501).....2

C.1 RIGHT SIDE VIEW, MAIN CABINET ELECTRONICS (CABINET ASS'Y - 005-28579-501) 3

C.2 DC POWER DISTRIBUTION CHASSIS.....4

C.3 E-STOP & INTERLOCK BOARD ASSEMBLY.....6

C.4 COMPUTER CHASSIS ASSEMBLY (196-31487-500).....7
C.4a CPU Controller (SAT-520).....8
C.4b Daughter Card.....8

C.5 AC DISTRIBUTION ASSEMBLY (502-31475-500) 9

C.6 INTERCONNECT BOARD (042-31483-500) 10

C.7 OPTO RACKS – PORT 0, 1 AND 2.....11

C.8 SINGLE CHANNEL READ CARD 12

C.9 LINE CODE READ CHASSIS 12

C.9 LINE CODE READ CHASSIS 13

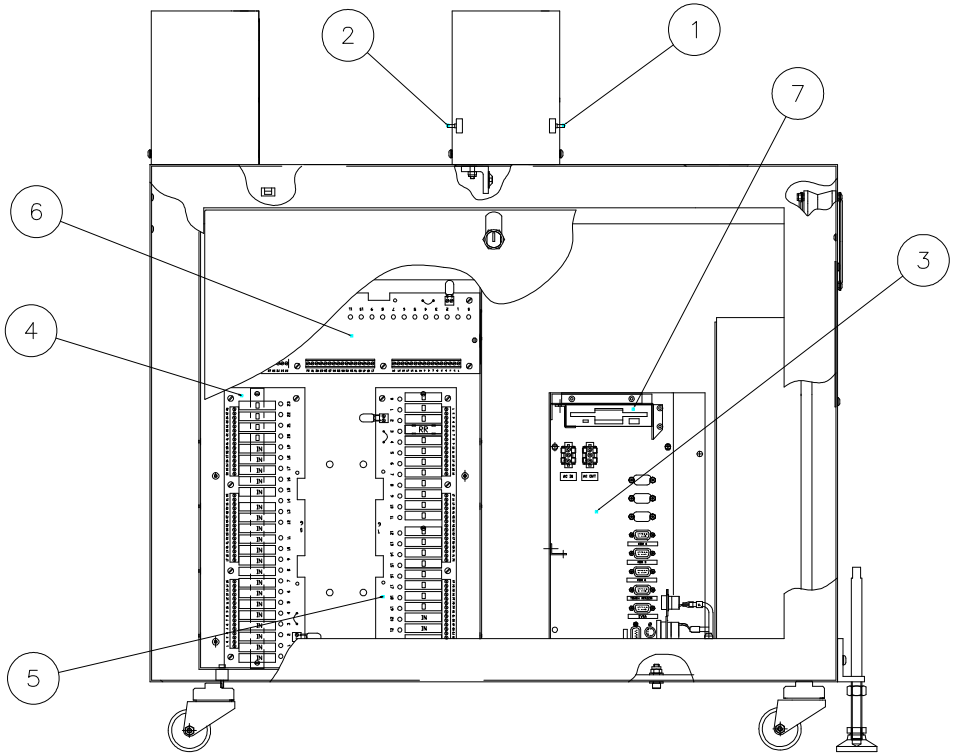
C.10 INK MARKER CONTROL BOARD 15

C.11 CREEPER CONVEYOR MOTOR CONTROLLER.....16

C.12 FEEDER MOTOR CONTROLLER.....17

C.13 ELECTRONICS SCHEMATICS.....18

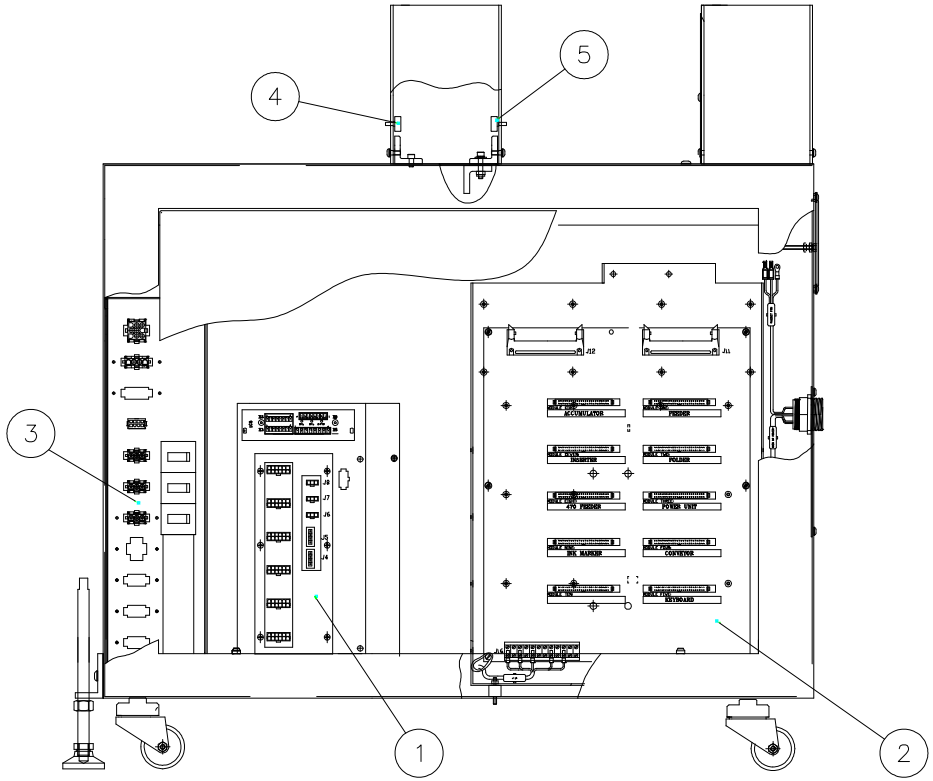
C.1 LEFT SIDE VIEW, MAIN CABINET ELECTRONICS (CABINET ASS'Y - 005-28579-501)



QTY	DESCRIPTION	PART NUMBER	ITEM
1	Drive, 3.5 Floppy	710–26743–000	7
1	Board, 24 I/O (Port 2)	042–PB24MV	6
1	Board, 24 I/O (Port 1)	042–PB24MV	5
1	Board, 24 I/O (Port 0)	042–PB24MV	4
1	Computer Assembly	196–31487–500	3
1	Creeper Motor Speed Control	049–28585–500	2
1	Feeder Motor Speed Control	049–28585–500	1

Parts List

C.1 RIGHT SIDE VIEW, MAIN CABINET ELECTRONICS (CABINET ASS'Y - 005-28579-501)

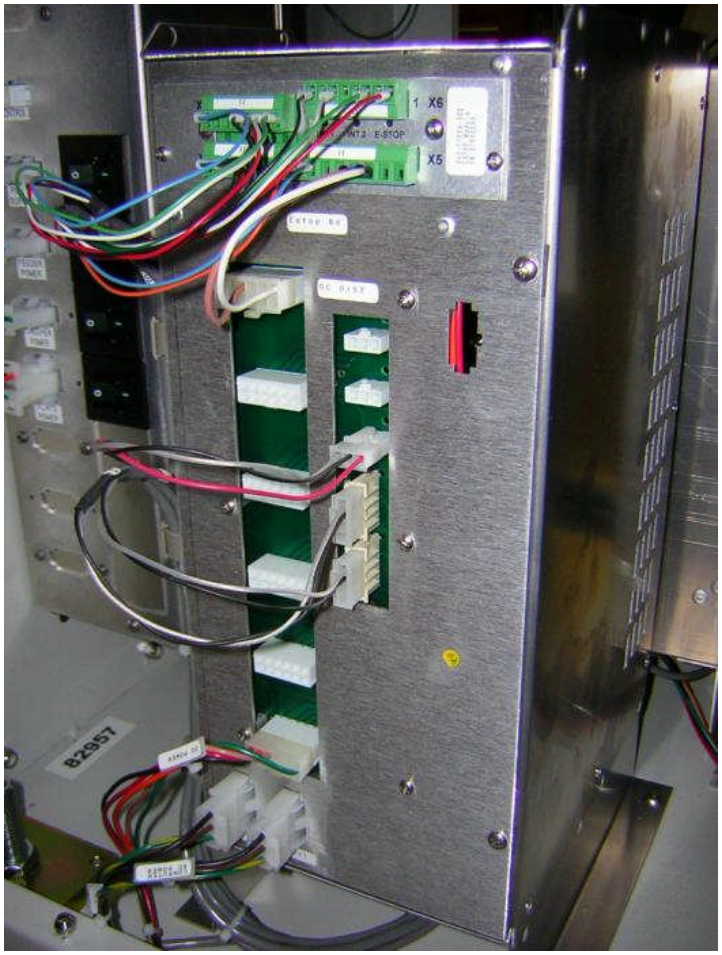


ITEM	DESCRIPTION	PART NUMBER	QTY
5	Speed Control, Feeder Motor	049-28585-500	1
4	Speed Control, Creeper Motor	049-28585-500	1
3	Panel, AC Distribution	502-31475-500	1
2	Interconnect Board	042-31483-500	1
1	Power Supply DC	044-31500-500	1

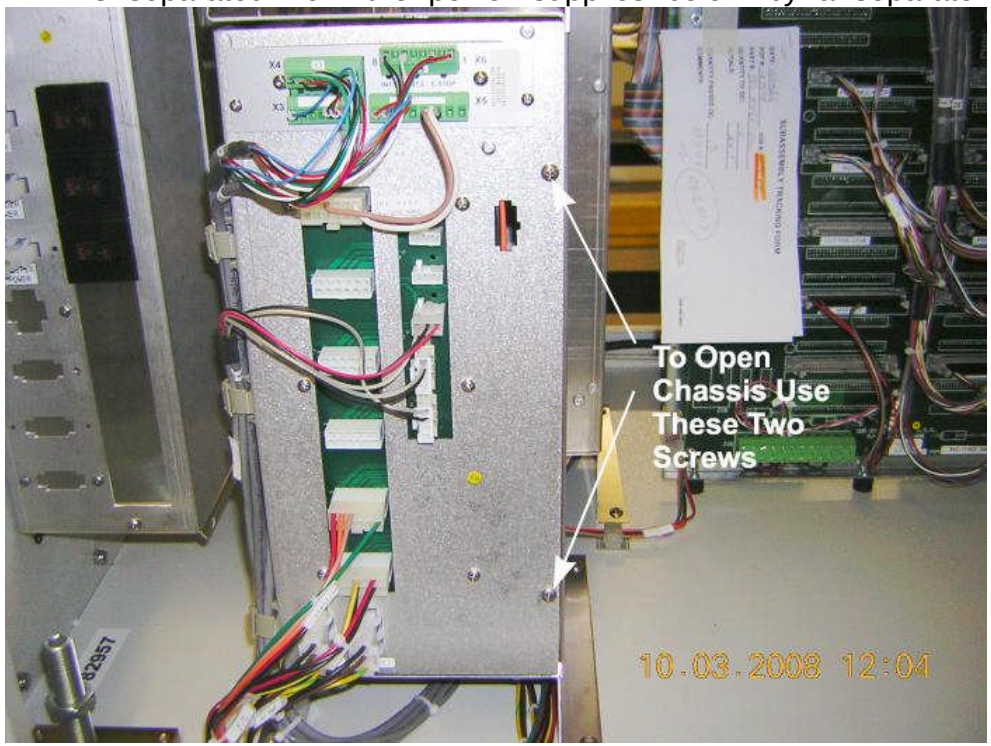
Parts List

C.2 DC POWER DISTRIBUTION CHASSIS

(Power Supply Ass'y 044-31500-500)

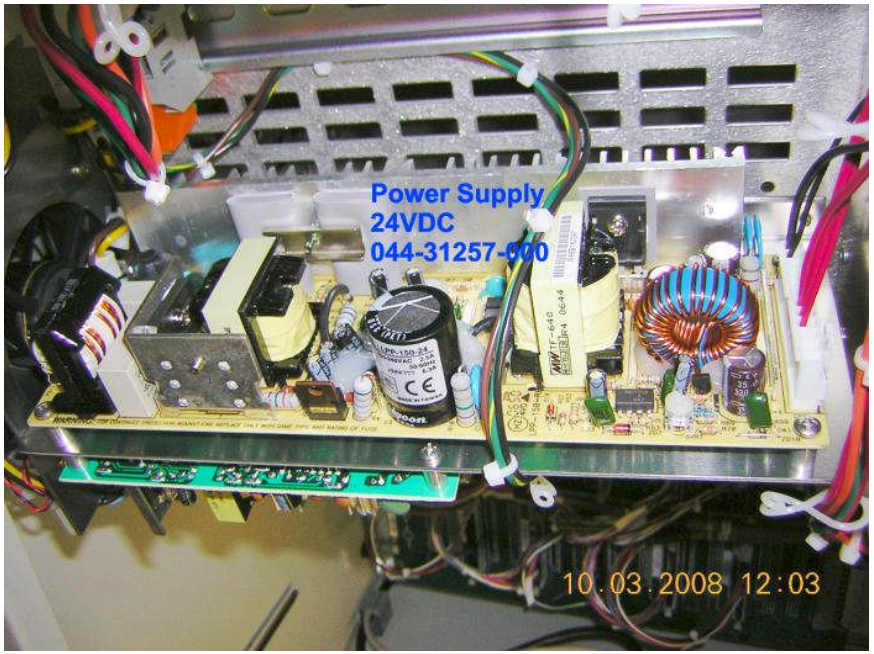


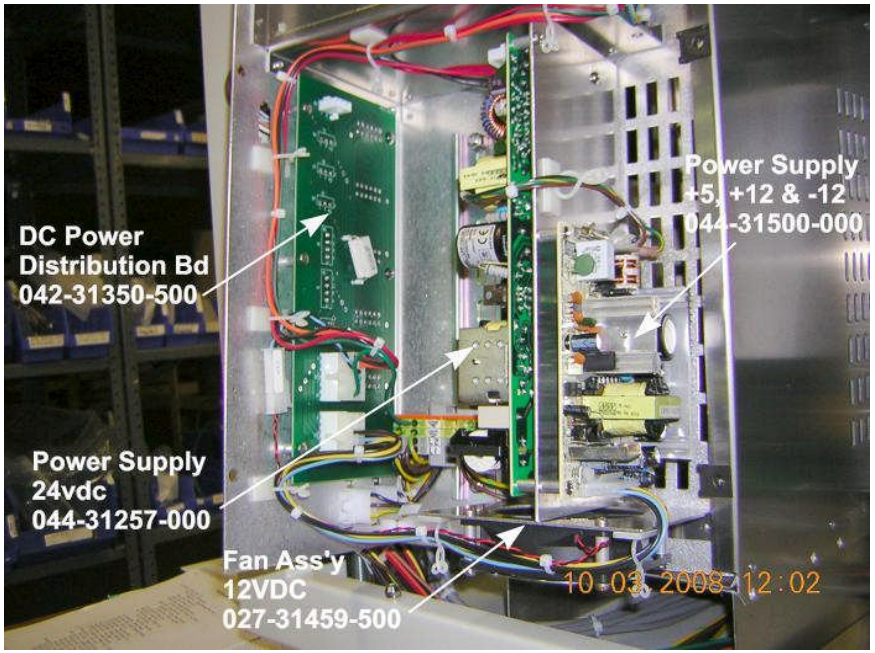
Above is the DC Power Distribution enclosure that contains a 24vdc, a +5, +12 -12vdc power supplies. The E-Stop and Interlock board is also enclosed at the top of this enclosure and is separated from the power supplies below by a separate enclosure.

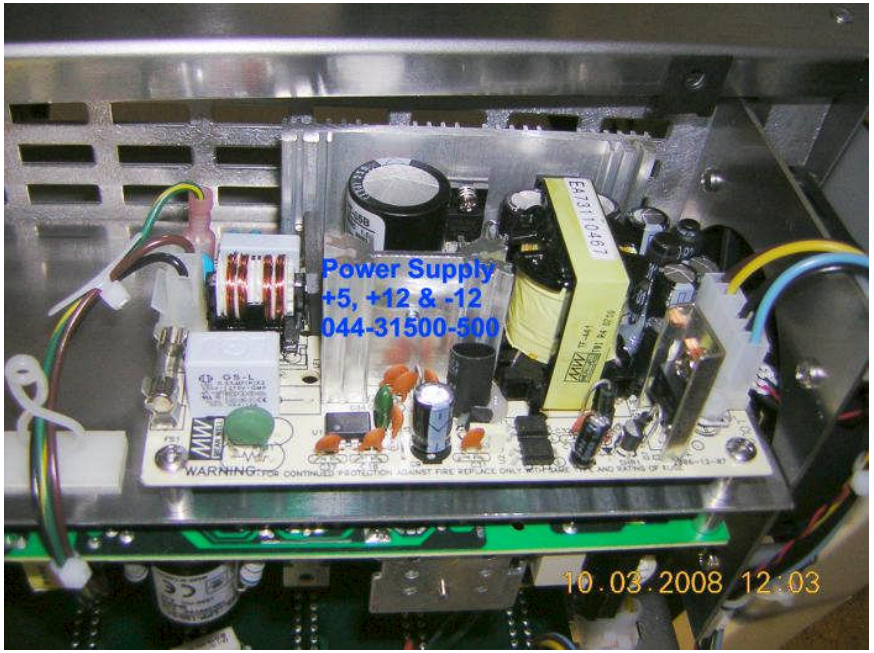


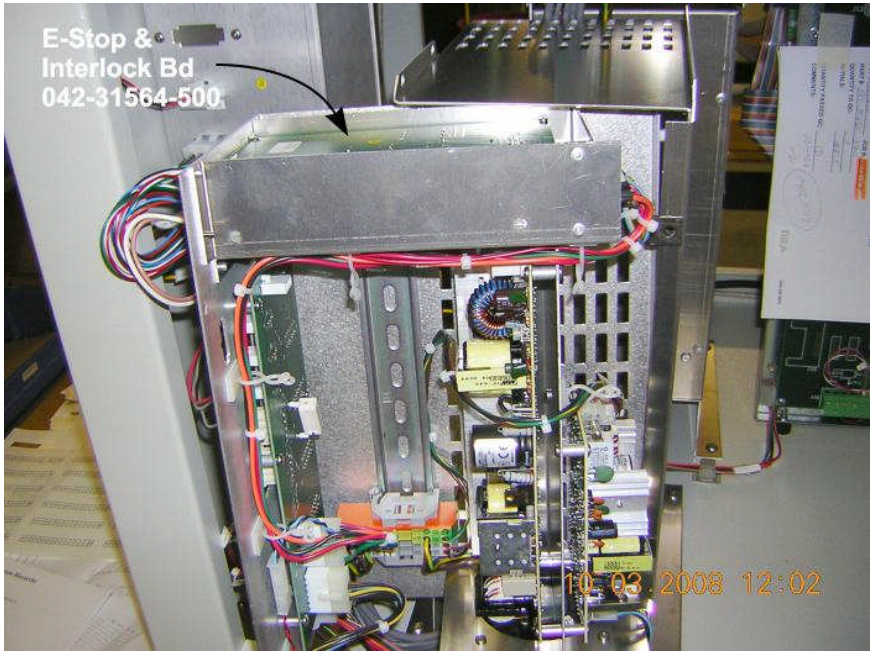
The 24vdc supply is used to power the input/output modules on the relay opto racks and to power clutches, brakes and sensors and E-Stop & interlock circuits.

The +5vdc supply is used to power the reader backplane, reader encoder, CPU and other digital circuits.

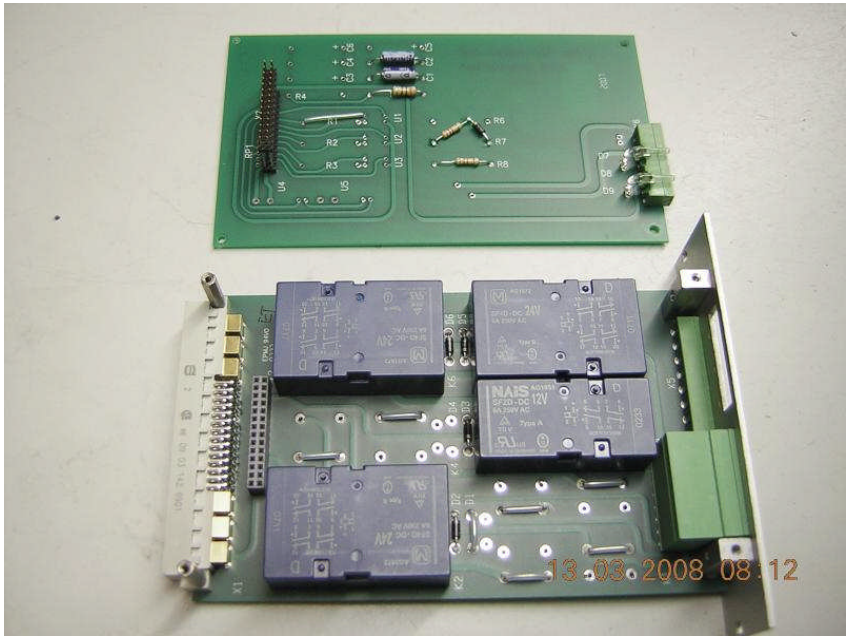

Power Supply
24VDC
044-31257-000
10.03.2008 12:03

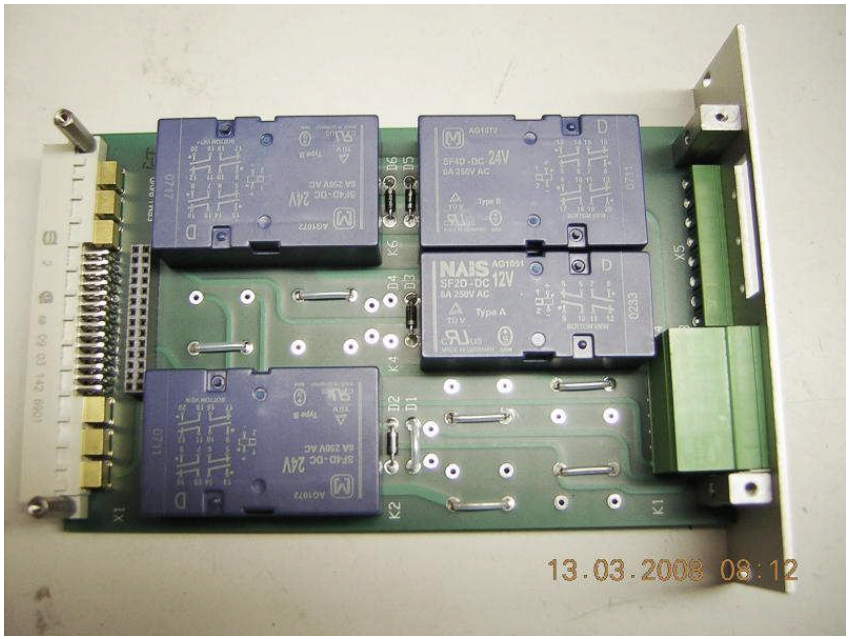

DC Power
Distribution Bd
042-31350-500
Power Supply
+5, +12 & -12
044-31500-000
Power Supply
24vdc
044-31257-000
Fan Ass'y
12VDC
027-31459-500
10.03.2008 12:02

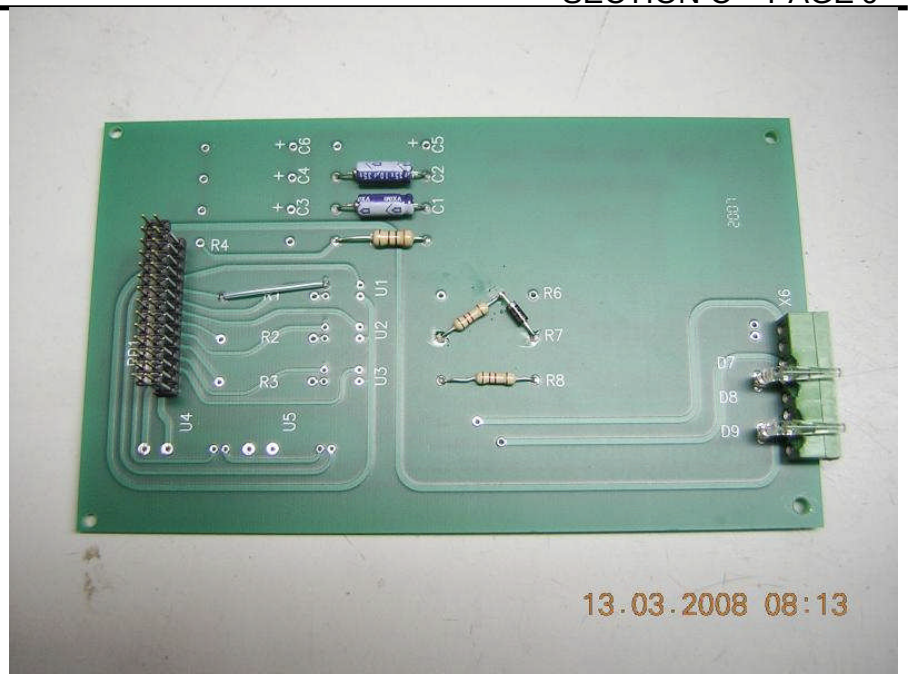

Power Supply
+5, +12 & -12
044-31500-500
10.03.2008 12:03


E-Stop &
Interlock Bd
042-31564-500
10.03.2008 12:02

C.3 E-STOP & INTERLOCK BOARD ASSEMBLY



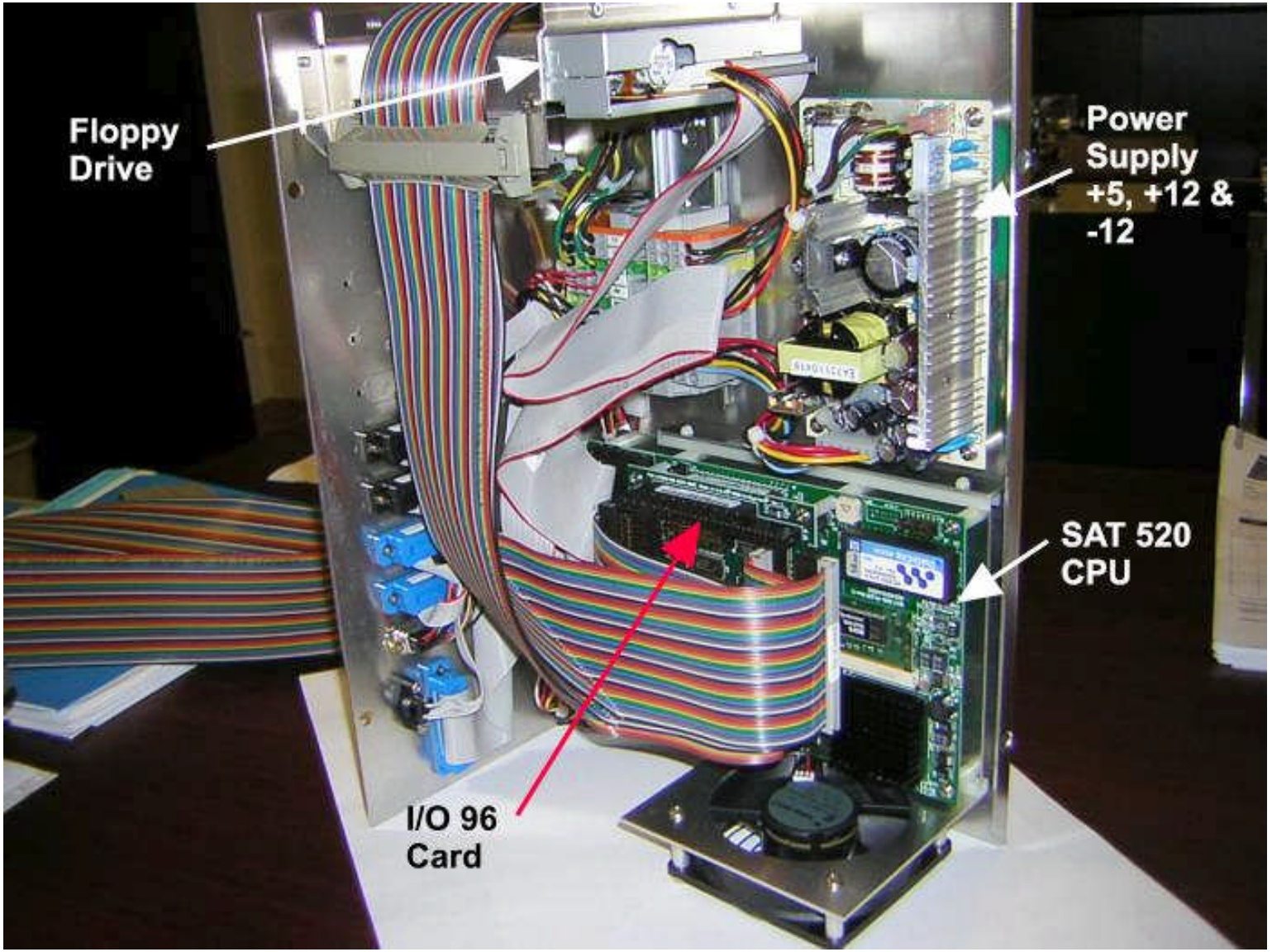




The two boards shown on this page are connected together to make one assembly and although these boards can be separated into two separate assemblies it is recommended that the board with the relays on it be replaced as a complete assembly including all relays should it become necessary. The relays on the board are connected in such a way that it is difficult to troubleshoot and the assembly is a protection device to prevent harm to individuals during the machines operation.

The assembly's location is inside of the top of the DC Power Distribution Chassis Assembly. (Shown on page 5 of this manual)

C.4 COMPUTER CHASSIS ASSEMBLY (196-31487-500)



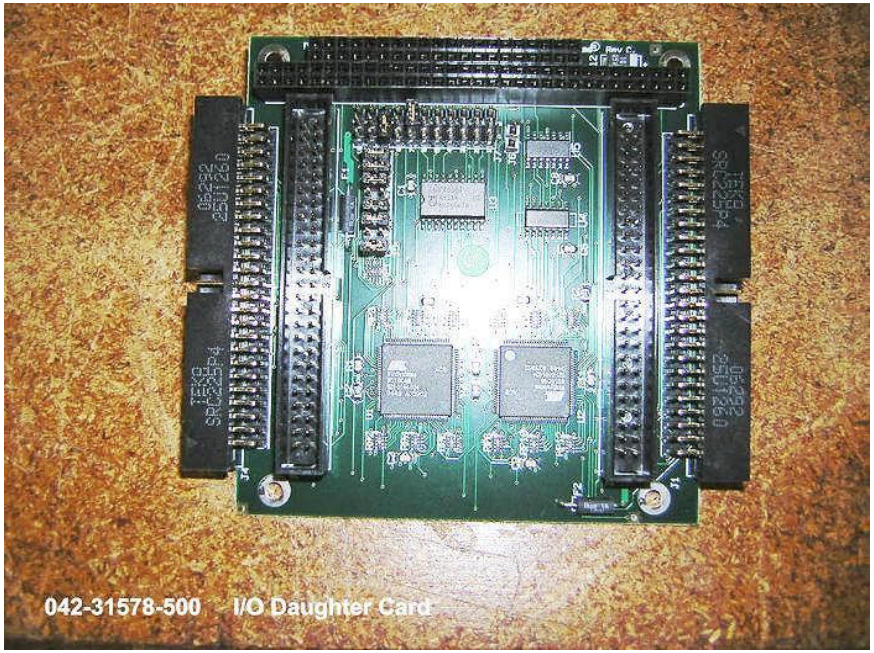
C.4a CPU Controller (SAT-520)

Video, I/O, up to 4 Serial Interface (RS232 Ports), two floppy drive interface, Internet and LPT1 Port.

Description of Ports:

1. Access panel for Line Read
2. BCR Com Ports
3. Not Used
4. Floppy Disk Port
5. Printer Port
6. COM 2 Serial Port
7. Touch Screen Port
8. SVGA Port

C.4b Daughter Card



General Description

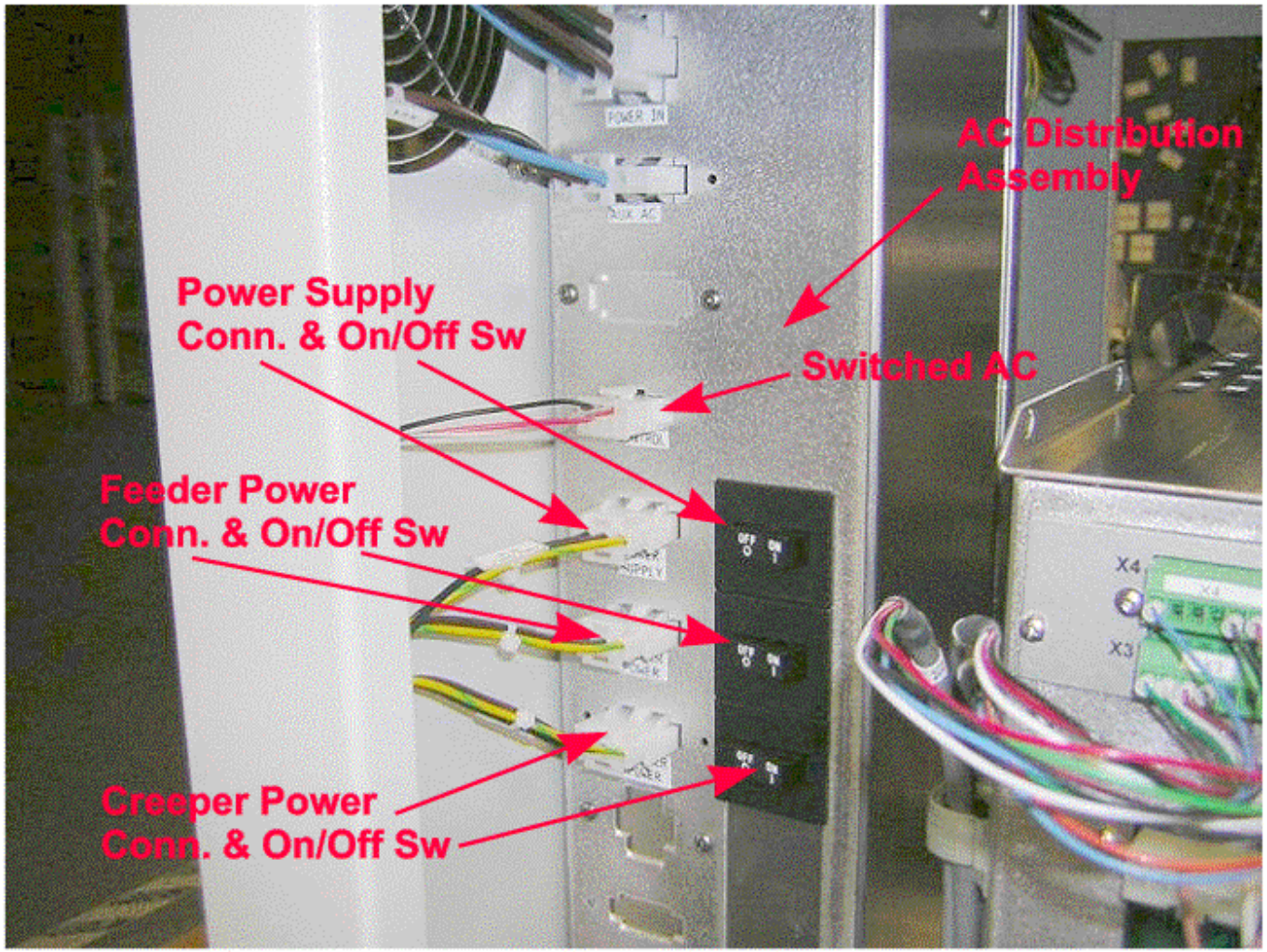
SAT-520 Daughter Card installed as (2 x 48 I/O (two cards stacked) or 1 x 96 I/O)

The I/O 96 card is responsible for the Input/Output interface between the CPU card and external inputs and outputs.

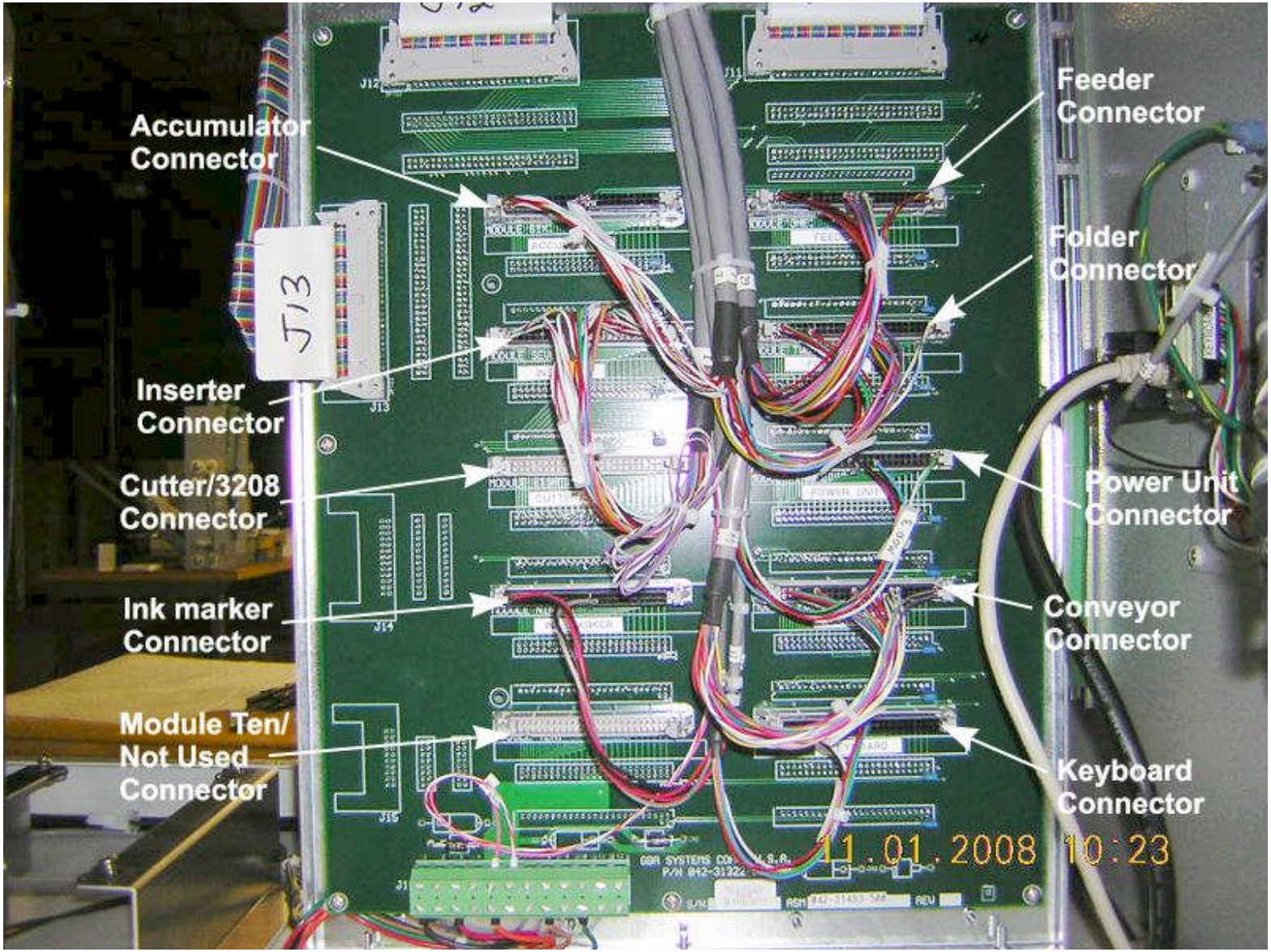
Configuration

- Jumpers as shown in diagram
- J1 to touch screen
- J1 to RS232 connector on cabinet bulkhead
- J16 to floppy drive

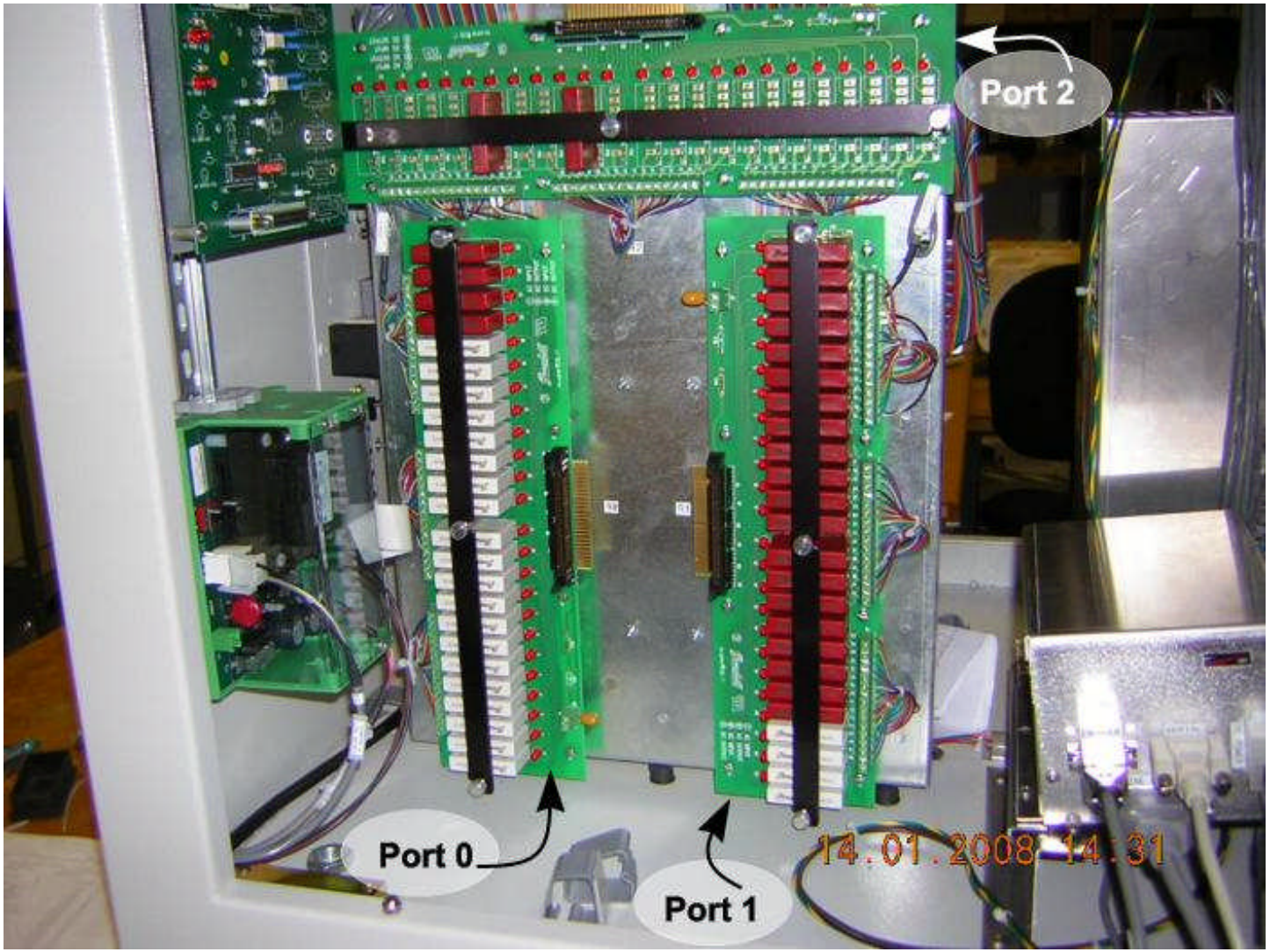
C.5 AC DISTRIBUTION ASSEMBLY (502-31475-500)



C.6 INTERCONNECT BOARD (042-31483-500)



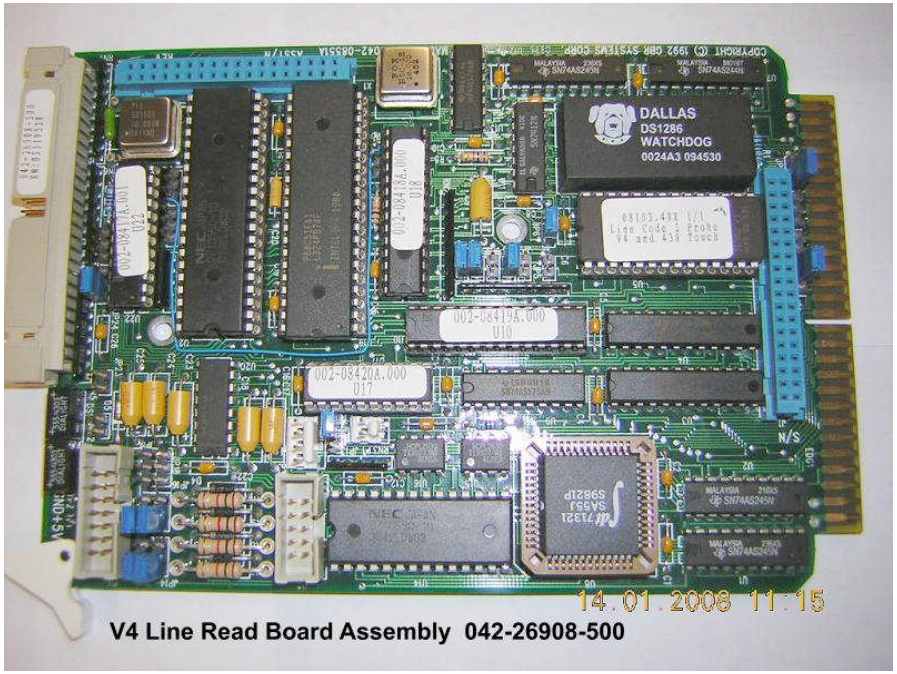
C.7 OPTO RACKS – PORT 0, 1 AND 2



The opto racks hold the input and output modules and transfer their signals to and from the opto board via ribbon cables plugged into their respective headers.

The input and output modules are restrained under a bar that is fastened with screws to the boards on both ends and in the middle. The input modules are white and the output modules are red. The white input modules come in two flavors, a regular and a high speed. The red output modules also come in two flavors, regular and reed relay. The high speed white modules are used for input pulses that are very short. The red reed relay output modules are used in circuits where the current draw is high, e.g. motors. It is easy to tell if the module is working by looking at the appropriate LED device next to the module. If it is on it the module is said to be active.

C.8 SINGLE CHANNEL READ CARD



GBR Part Number (w/GBR Line Code): 042-26908-500

This card is provided only when certain options are included in the 438.

Function:

- Interfaces with the Pc104 serially.
- Processes signals from the GBR (TJ) or B+H Line Code Cards
- Processes Read encoder signals
- For B+H Line Read process edge detect and bar detect

LED Indications:

The following LED indications apply only when using B+H line code.

LED 1 ON/OFF every second indicating operation (except when LED 2 is lit)

LED 2 ON indicates busy: line code read taking place, calibration read taking place, or machine speed sample being done.

LED 3 ON indicates line codes will be read using calibration data that has been stored. OFF indicates line codes will be read without using calibration data that has been stored.

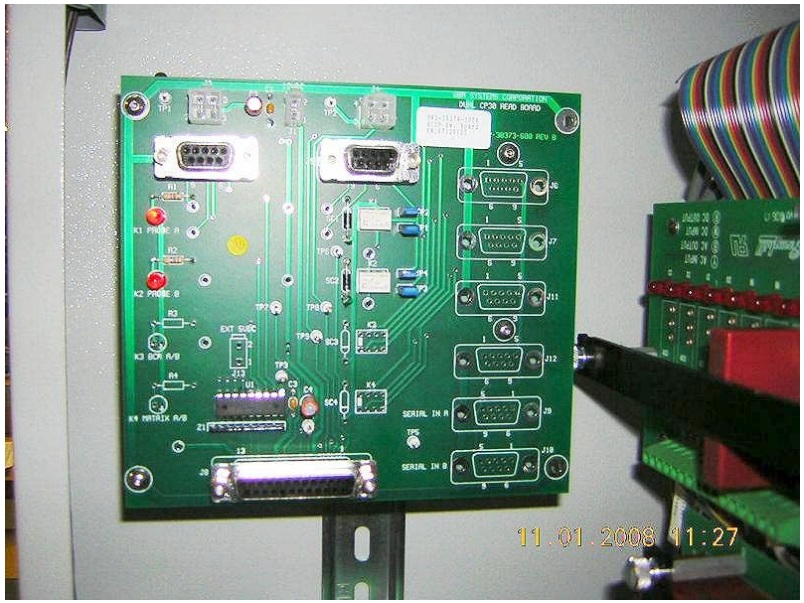
LED's 1-4 are all turned on while the boot functions are being done. All the lights will stay on if a problem is detected in the hardware of the line code reader card.

LED 5 Input of lead edge detection sensor probe 1 (sensing paper LED off).

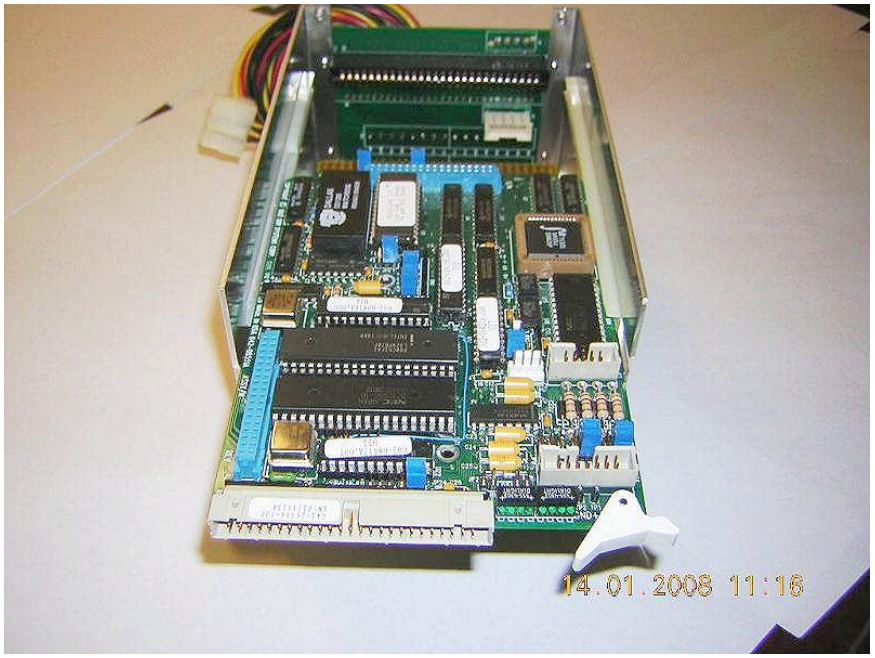
LED 6 Input of lead edge detection sensor probe 2 (sensing paper LED off).

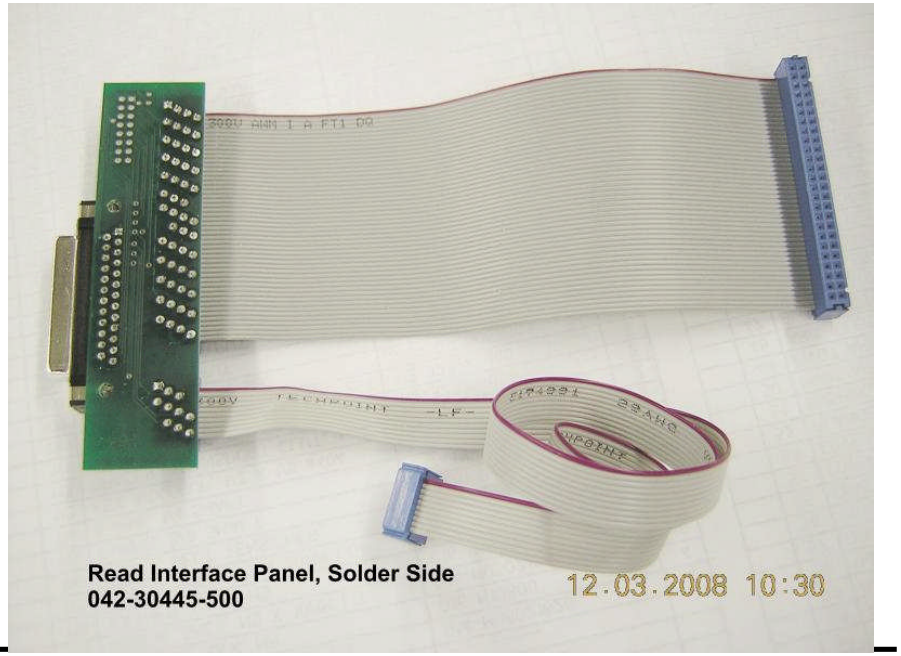
LED 7 Not used.

LED 8 Input of selected line code sensor (Probe 1 or Probe 2).



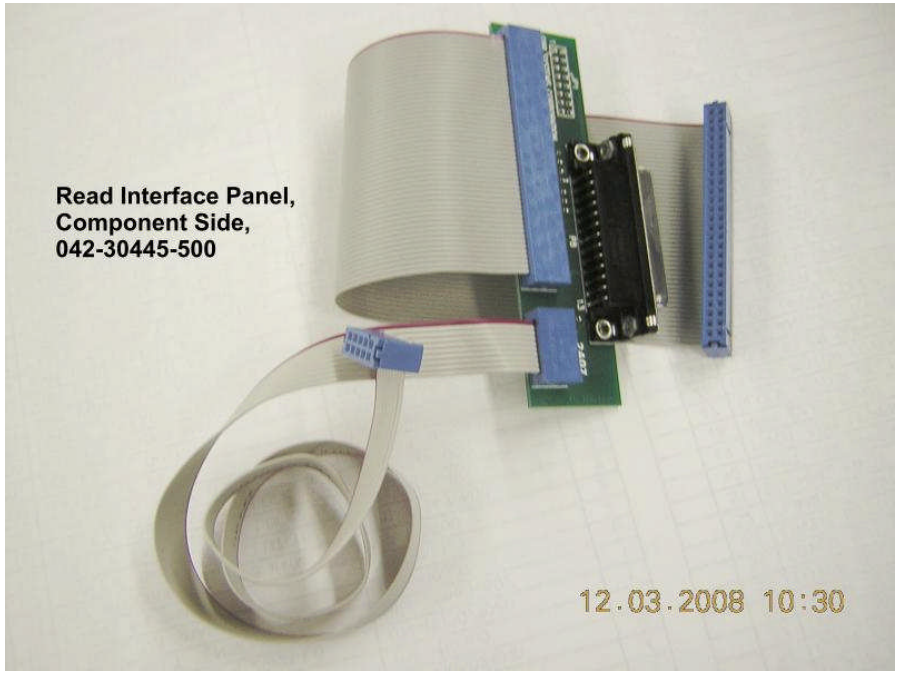
C.9 LINE CODE READ CHASSIS





The previous page contains various photos of the line read chassis assembly components. The housing is mounted to the top of the SAT-520 CPU housing. Top right is a picture of the housing with the cover removed and the read card slid out for a better view. Across the rear of the housing is a connector soldered into the backplane which mates with the read card.
In the lower left of the page is a picture of the backplane and the power connector. The red wire is +5vdc and the next black wire is 5vcom. The yellow wire is +12vdc and the associated black wire is 12vcom. The board is labeled below the connector.

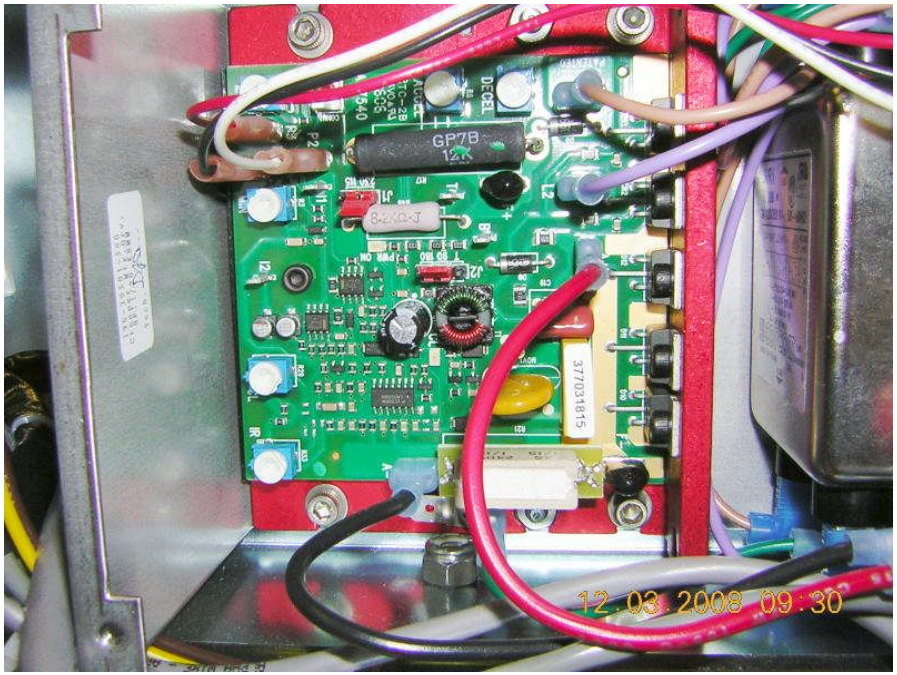
Just to the right and on the lower right of the previous page are photos of the Read Interface Panel. It is used internal of the read housing to bring the connections out the front panel of the housing and connects to the read board inside.

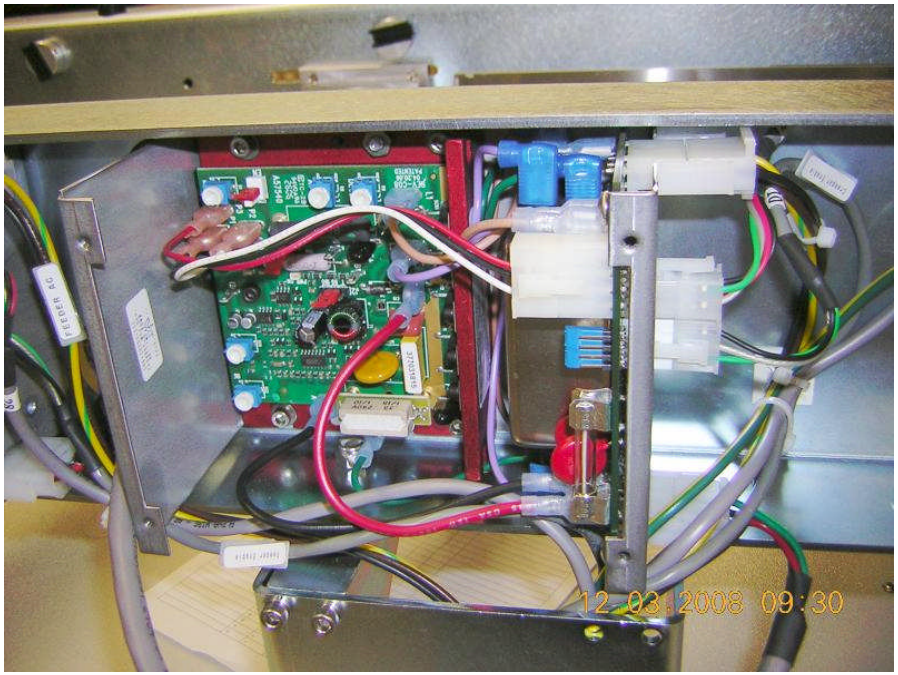


C.10 INK MARKER CONTROL BOARD

The above is a picture of an Ink Marker Control Board which permits an operator to control zip code sequencing on an inserter that supports Ink Marking. When the read code on a package which has been read by the GBR Feeder is delivered to the inserter information is passed to the inserter. This information can include a line or mark which will indicate if the zip sequence has changed; whether or not the ink marking device should be activated when the envelope is passed from the inserter toward the stacking device.

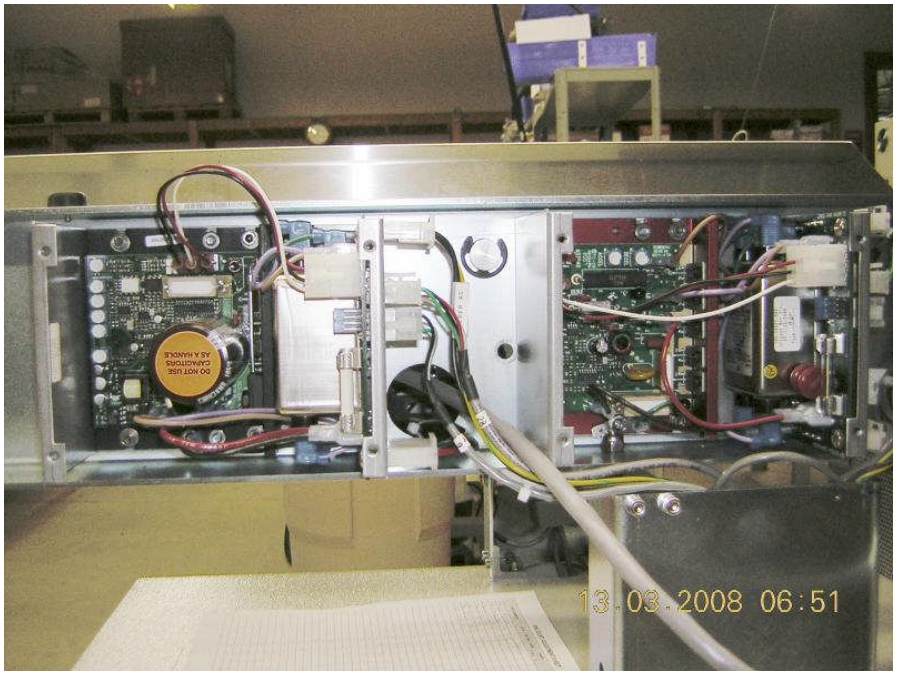
C.11 CREEPER CONVEYOR MOTOR CONTROLLER





The V4 Friction Feeder uses a 90vdc motor (shown here in two pictures) controller to adjust and maintain speeds of the motor by a set constant voltage output. The creeper conveyor motor is actuated whenever the paper demand wand has been lowered and trips the switch in the feed hopper. There are four connectors that plug into the controller housing, speed control, enable circuit, ac voltage and motor output.

C.12 FEEDER MOTOR CONTROLLER



In the above picture, on the left, is the feeder motor controller. A close-up is on the right. It is a PWM controller and provides excellent voltage constant over the speed range of the controller.

C.13 ELECTRONICS SCHEMATICS

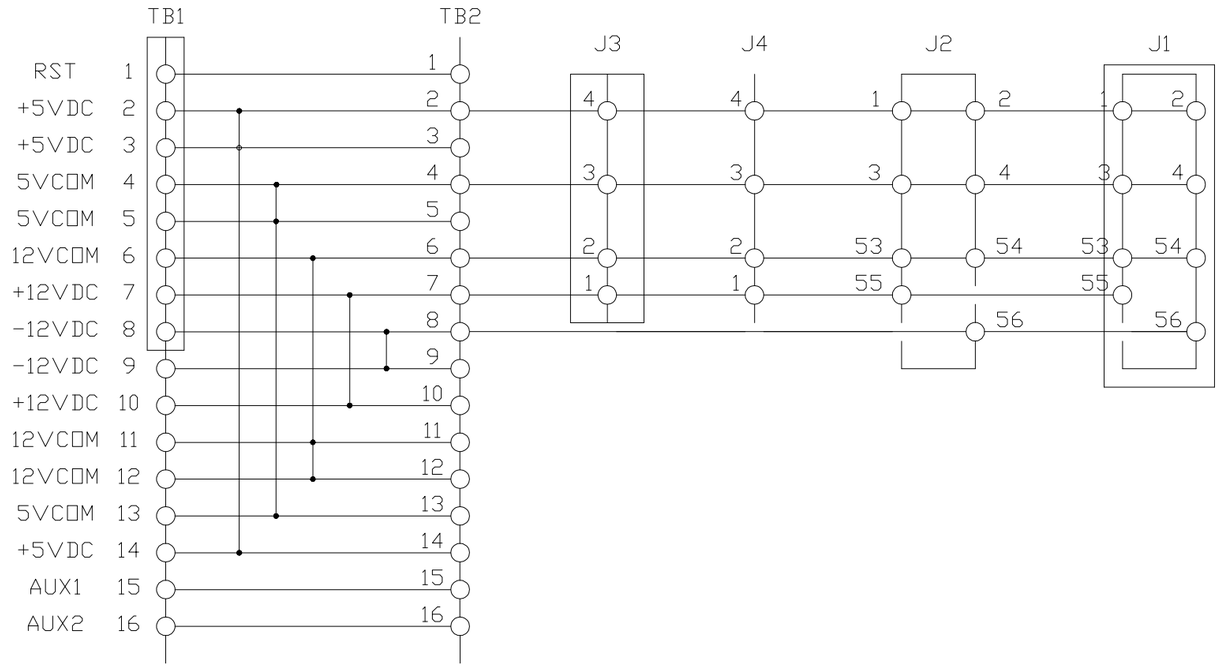
The following is a list of the requisite schematics for the 438 system.

Drawing #	Description	Page
042-31549-300	Reader Backplane F30	21
042-31350-300	DC Distribution PCB 438 V4 Elect.	22
196-30500-300	Schematic, Feeder	23
196-30501-300	Schematic Creeper Contl Motor	24
196-30502-300	Schematic, Feeder Motor PCB	25
196-30503-300	Schematic, Controller, Creeper Motor PCB	26
597-31570-301	AC Power Distribution Control Cabinet	27
597-31570-302	AC Power Distribution Chassis 438 V4 Elect.	28
597-31570-303	DC Power Distribution Control Cabinet V4 Elect.	29
597-31570-304	DC Power Distribution Chassis V4 Elect.	30
597-31570-305	E-Stop & Interlock (Sheet 1 of 2)	31
597-31570-305	E-Stop & Interlock (Sheet 2 of 2)	32
597-31570-306	I_O Interconnect, 438 V4 Elect.	33
597-31570-307	I_O Interconnect, Rack Port 0	34
597-31570-308	I_O Interconnect, Rack Port 1	35
597-31570-309	I_O Interconnect, Rack Port 2	36
597-31570-310	I_O Feeder Module 1	37
597-31570-311	Exit Conveyor Module 4 438 V4 Elect.	38
597-31570-312	Keyboard Module 5 438 V4 Elect.	39
597-31570-313	Folder/Accumulator AC Power Distribution 438 V4 Elect.	40
597-31570-314	Folder/Accumulator Control 438 V4 Elect.	41
597-31570-315	Flats Collector Control 438 V4 Elect.	42
597-31570-316	Inserter module 7 438 V4 Elect.	43
597-31570-317	SAT 520 CPU Chassis 438 V4 Elect.	44
597-31570-318	SAT 520 CPU With Touch and Read System 438 V4 Elect	45
597-31570-319	Line Code Read F30 438 V4 Elect.	46

Drawing #	Description	Page
	V4 3208 BULK LOADER SCH	
	V4 CUTTER BULKLOADER MODULES CABLE 22, 23, 24, 27	
	V4 INK MARK_KICKER_MOD9_CABLES 17, 19, 32	
	V4 LINE CODE READ_CP30	
	V4 MODULE8 CABLE22, 23, 24, 27	

SIZE	DWG NO.	SH
B	042-31549-300	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #		
FNSH: #		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°		438B
	NEXT ASSY	USED ON
	ORIGINAL APPLICATION	
	DRAWN E. HARRIS	2/7/2006
	CHECKED	
	APVL.	
REMOVE BURRS, SHARP EDGES & CORNERS		
THIRD ANGLE PROJECTION		
INTERPRET DRAWING PER ANSI Y14.5		

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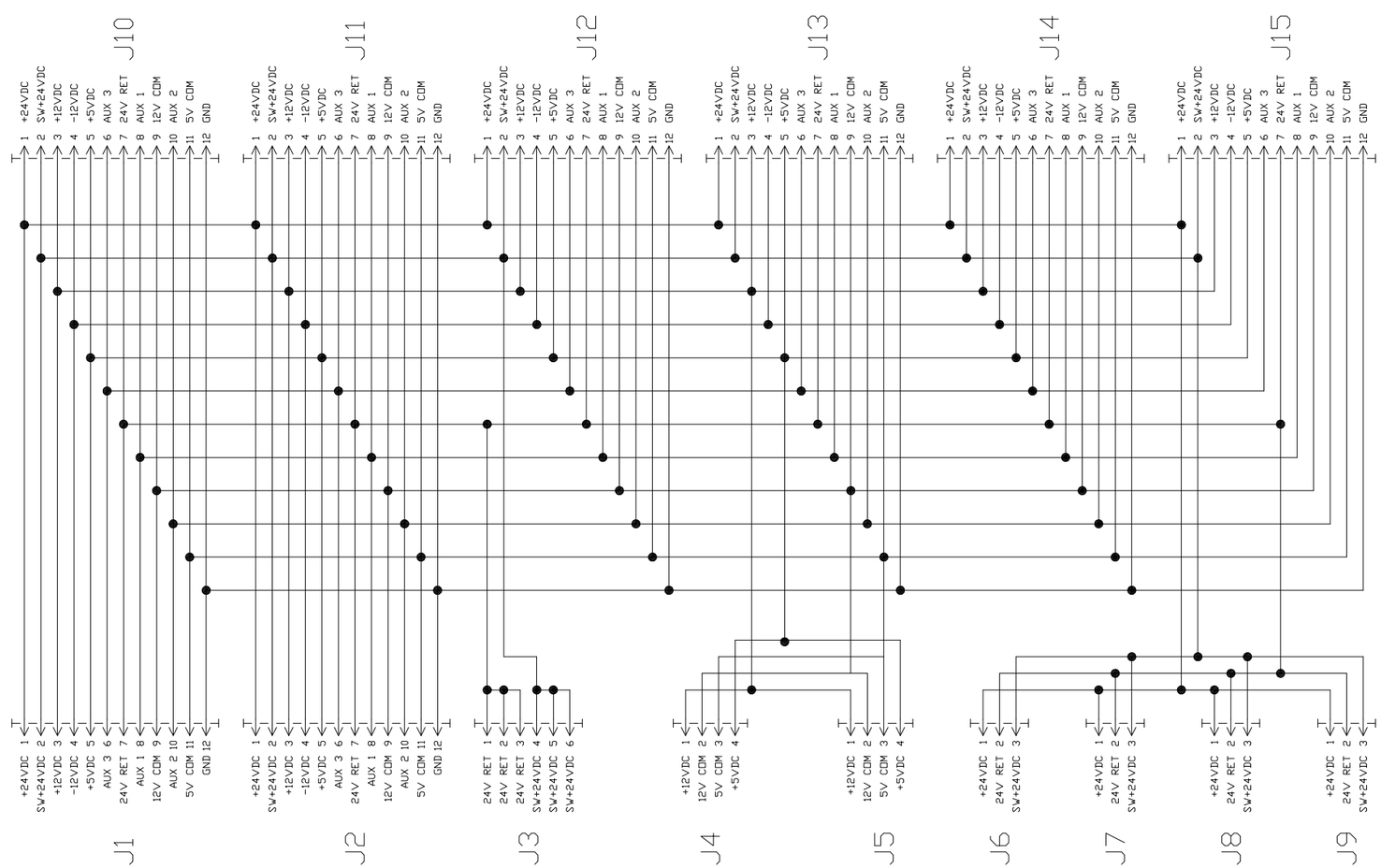
GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE: SCHEMATIC, READER BACKPLANE, CP30, 438 V4 ELECT.

SIZE	DWG NO.	
B	042-31549-300	
SCALE: 1:1		SHEET 1 OF 1

SIZE B | DWG NO. 042-31350-300 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ` 2~

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

	438B
NEXT ASSY	USED ON
ORIGINAL APPLICATION	
DRAWN E. HARRIS	2/7/2006
CHECKED	
APVL.	

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12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE: SCHEMATIC, DC DISTRIBUTION PCB, 438 V4 ELECT.

SIZE B | DWG NO. 042-31350-300

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 196-30500-300 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
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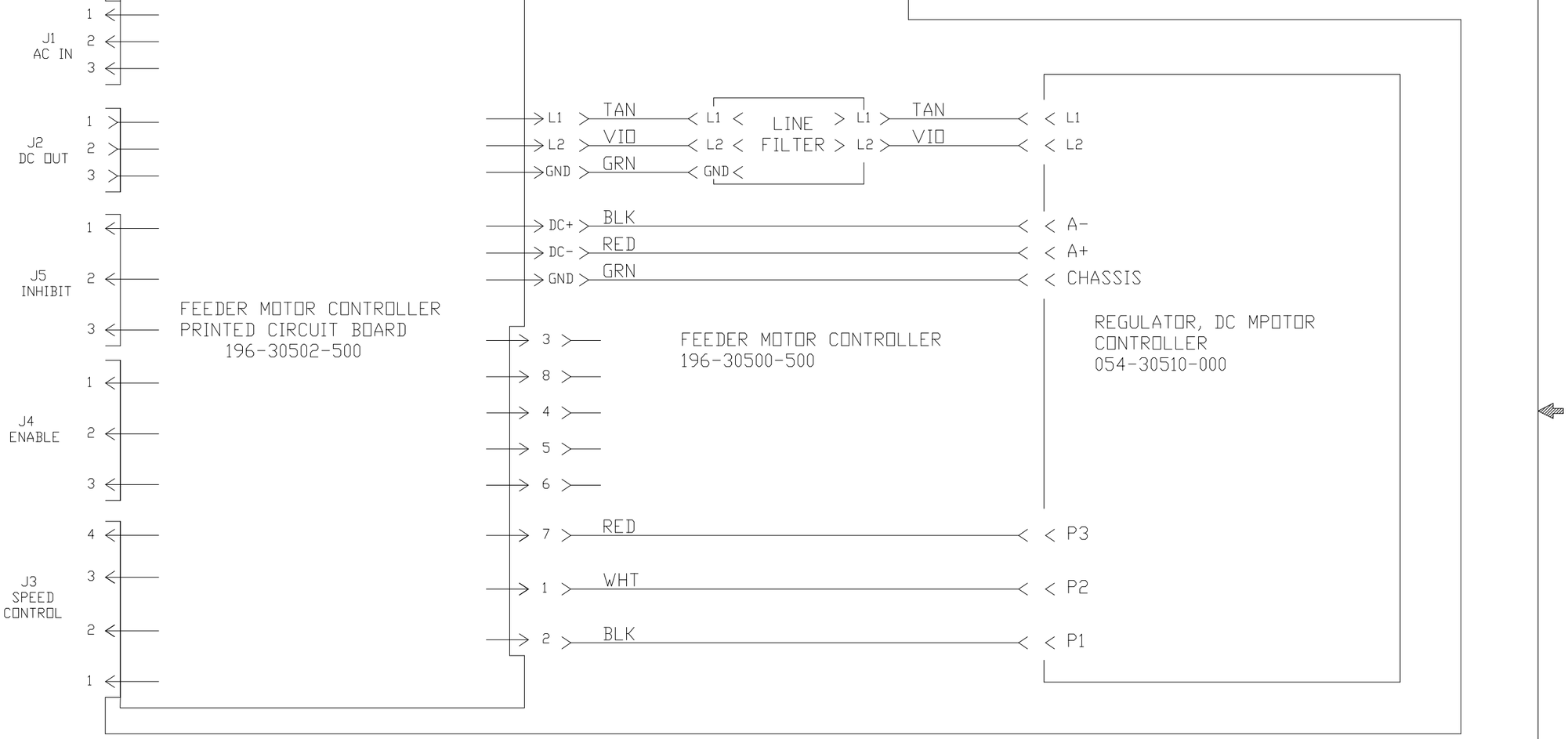
	A	DC+ WAS RED. DC- WAS BLK ECN 9150 WM	12-09-04	wfm



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438
ORIGINAL APPLICATION	
DRAWN W. MAZZA	3/24/04
CHECKED	
APVL.	

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GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE: SCHEMATIC, FEEDER

SIZE B | DWG NO. 196-30500-300

SCALE: 1:1 | SHEET 1 OF 1

SIZE B DWG NO. 196-30501-300 SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
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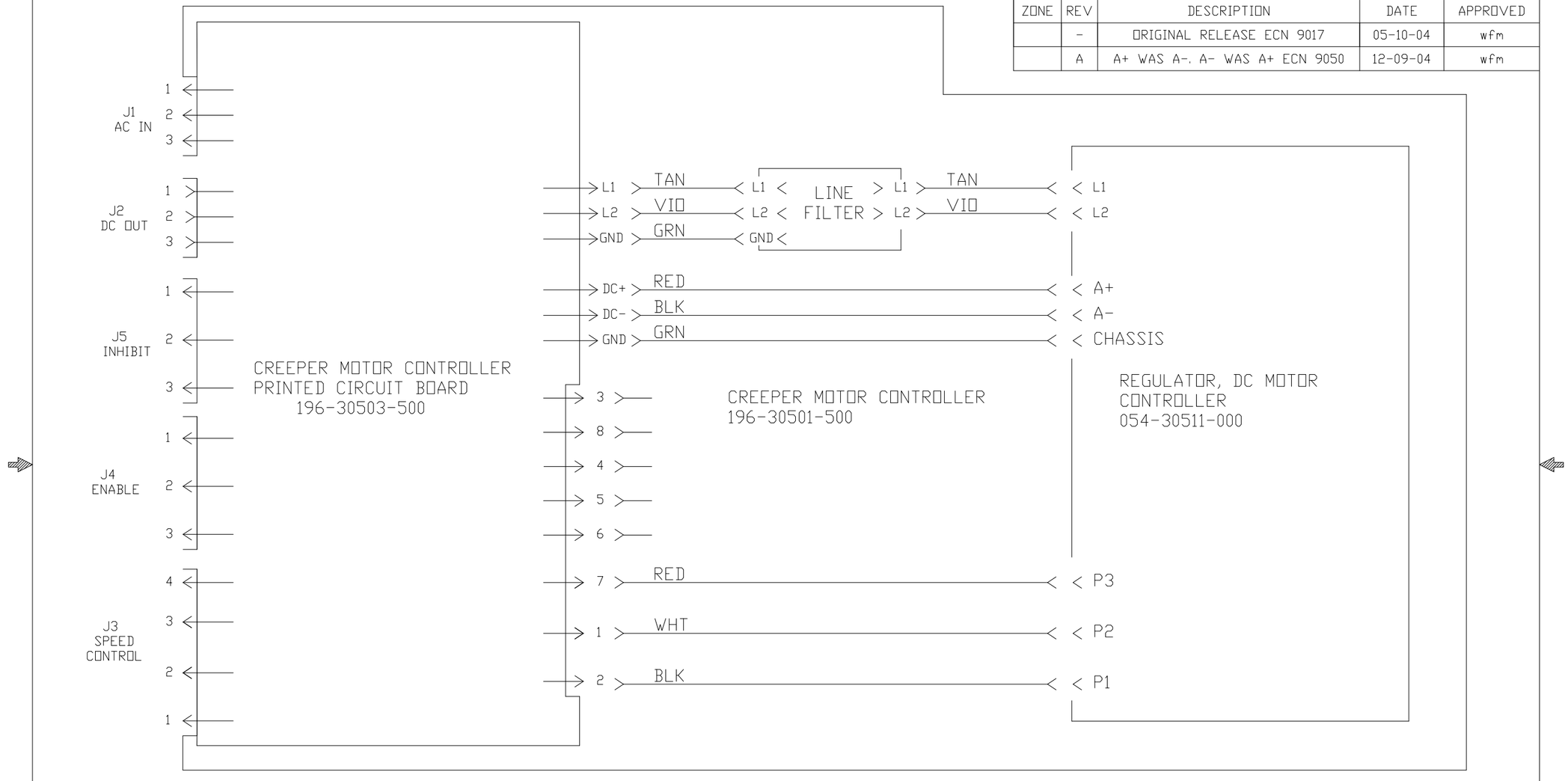
	A	A+ WAS A-, A- WAS A+ ECN 9050	12-09-04	wfm



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ' 2~

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438

ORIGINAL APPLICATION

DRAWN	W. MAZZA	3/24/04
CHECKED		
APVL.		

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GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

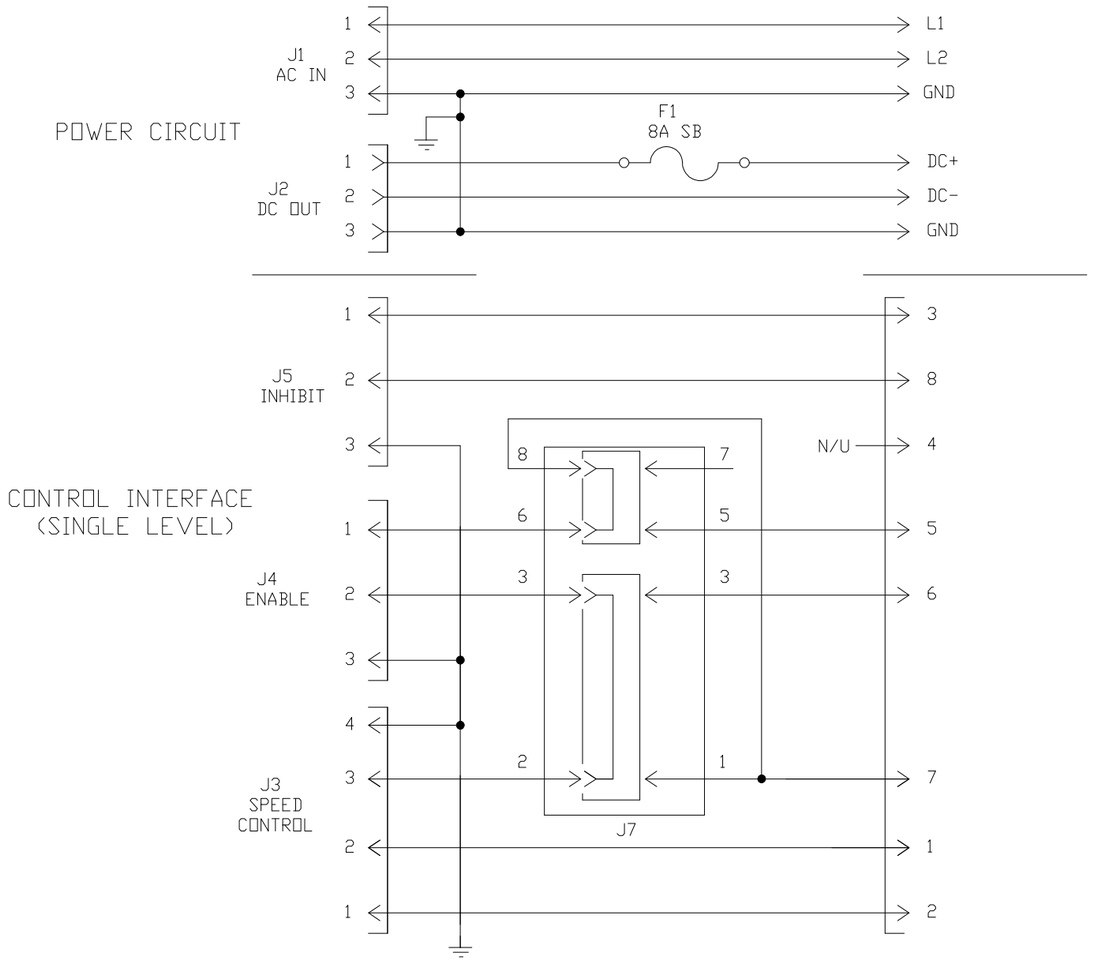
TITLE
SCHEMATIC CREEPER CONTL MOTOR

SIZE B | DWG NO. 196-30501-300

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 196-30502-300 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9017	05-10-04	wfm



MATL: #		
FNSH: #		
UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ` 2~		438
	NEXT ASSY	USED ON
	ORIGINAL APPLICATION	
REMOVE BURRS, SHARP EDGES & CORNERS	DRAWN W. MAZZA	3/24/04
	CHECKED	
THIRD ANGLE PROJECTION	APVL.	
INTERPRET DRAWING PER ANSI Y14.5	THIS DRAWING IS THE PROPERTY OF GBR SYSTEMS CORPORATION IT IS RETURNABLE UPON REQUEST AND MUST NOT BE REPRODUCED OR THE INFORMATION CONTAINED HEREIN TRANSMITTED TO ANY UNAUTHORIZED PERSON OR ORGANIZATION WITHOUT WRITTEN CONSENT FROM GBR SYSTEMS CORPORATION ©2001	

GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

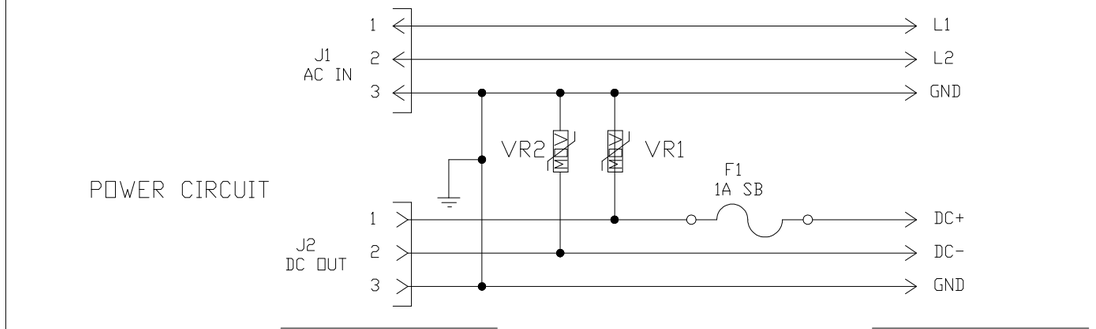
TITLE: SCHEMATIC, FEEDER MOTOR, PCB

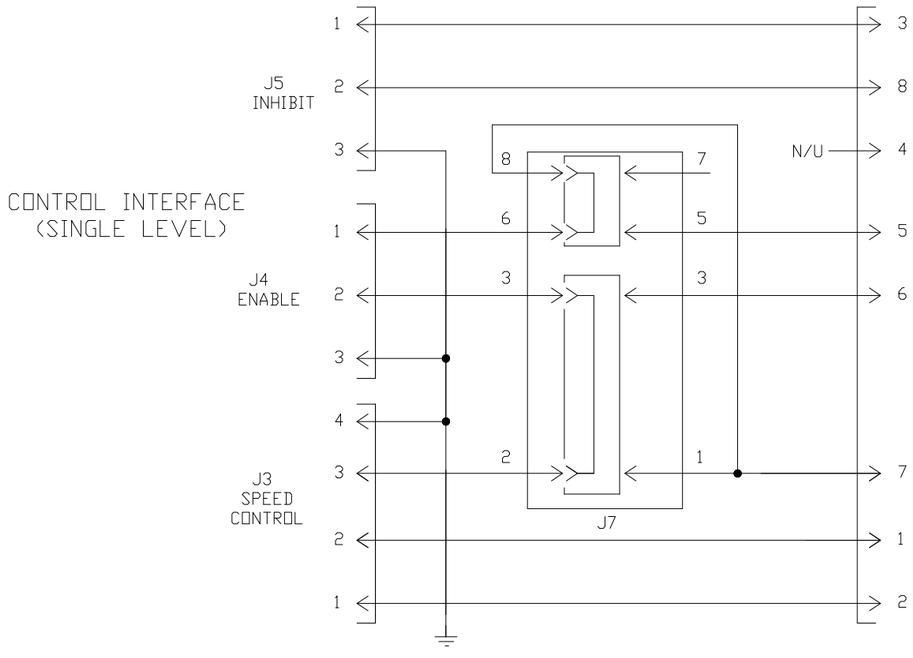
SIZE B | DWG NO. 196-30502-300

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 196-30503-300 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9017	05-10-04	wfm





MATL: #		
FNSH: #		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°		438
	NEXT ASSY	USED ON
	ORIGINAL APPLICATION	
	DRAWN W. MAZZA	4/5/04
	CHECKED	
REMOVE BURRS, SHARP EDGES & CORNERS	APVL.	
THIRD ANGLE PROJECTION		
INTERPRET DRAWING PER ANSI Y14.5		

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GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

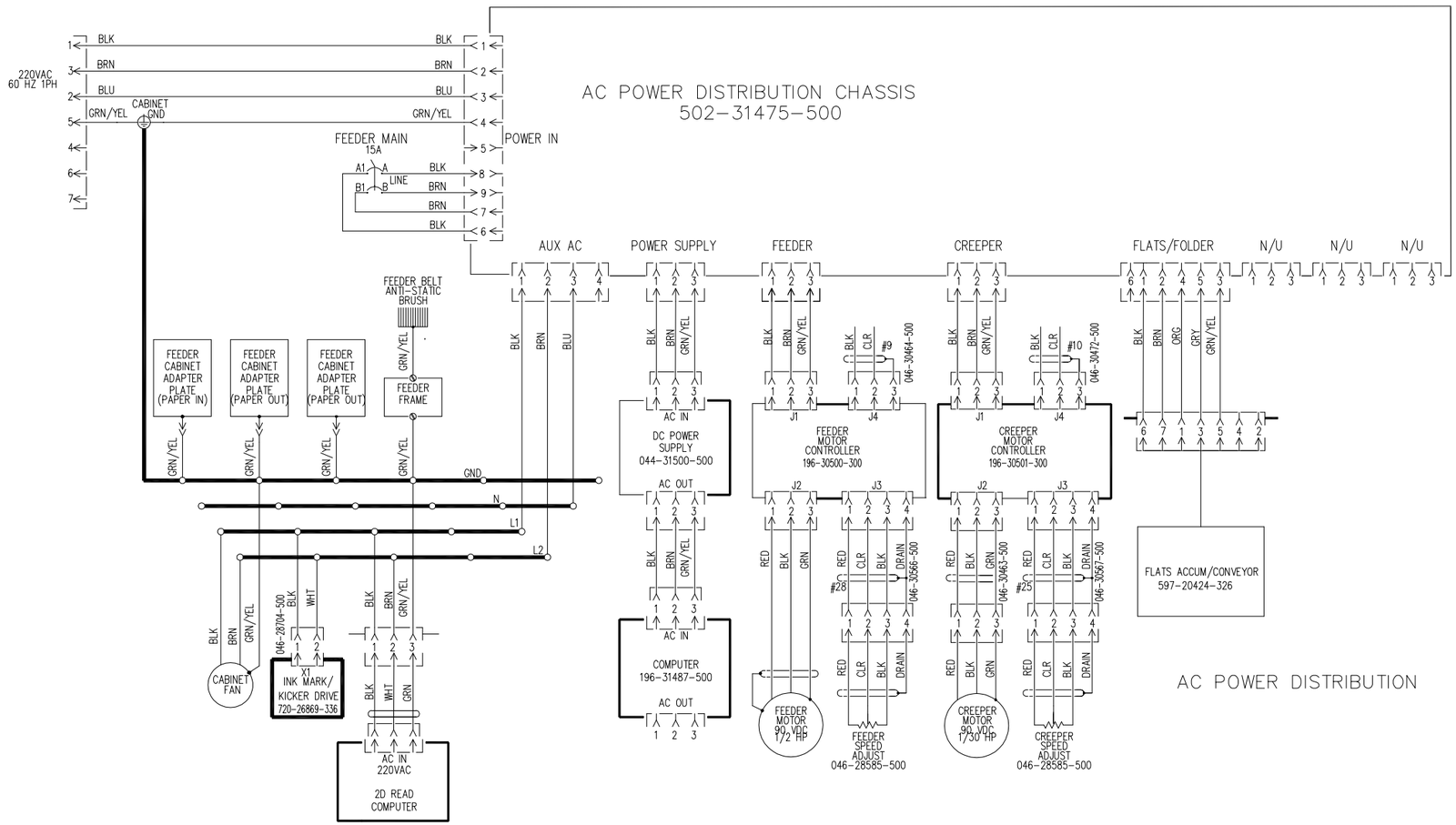
TITLE: SCHEMATIC, CONTROLLER, CREEPER MOTOR PCB

SIZE B | DWG NO. 196-30503-300

SCALE: 1:1 | SHEET 1 OF 1

SIZE	DWG NO.	SH
B	597-31570-301	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



AC POWER DISTRIBUTION

MATL: #		
FNSH: #		
UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°	NEXT ASSY	438B
	USED ON	ORIGINAL APPLICATION
REMOVE BURRS, SHARP EDGES & CORNERS	DRAWN E. HARRIS	2/7/2006
	CHECKED	
THIRD ANGLE PROJECTION	APVL.	

INTERPRET DRAWING PER ANSI Y14.5

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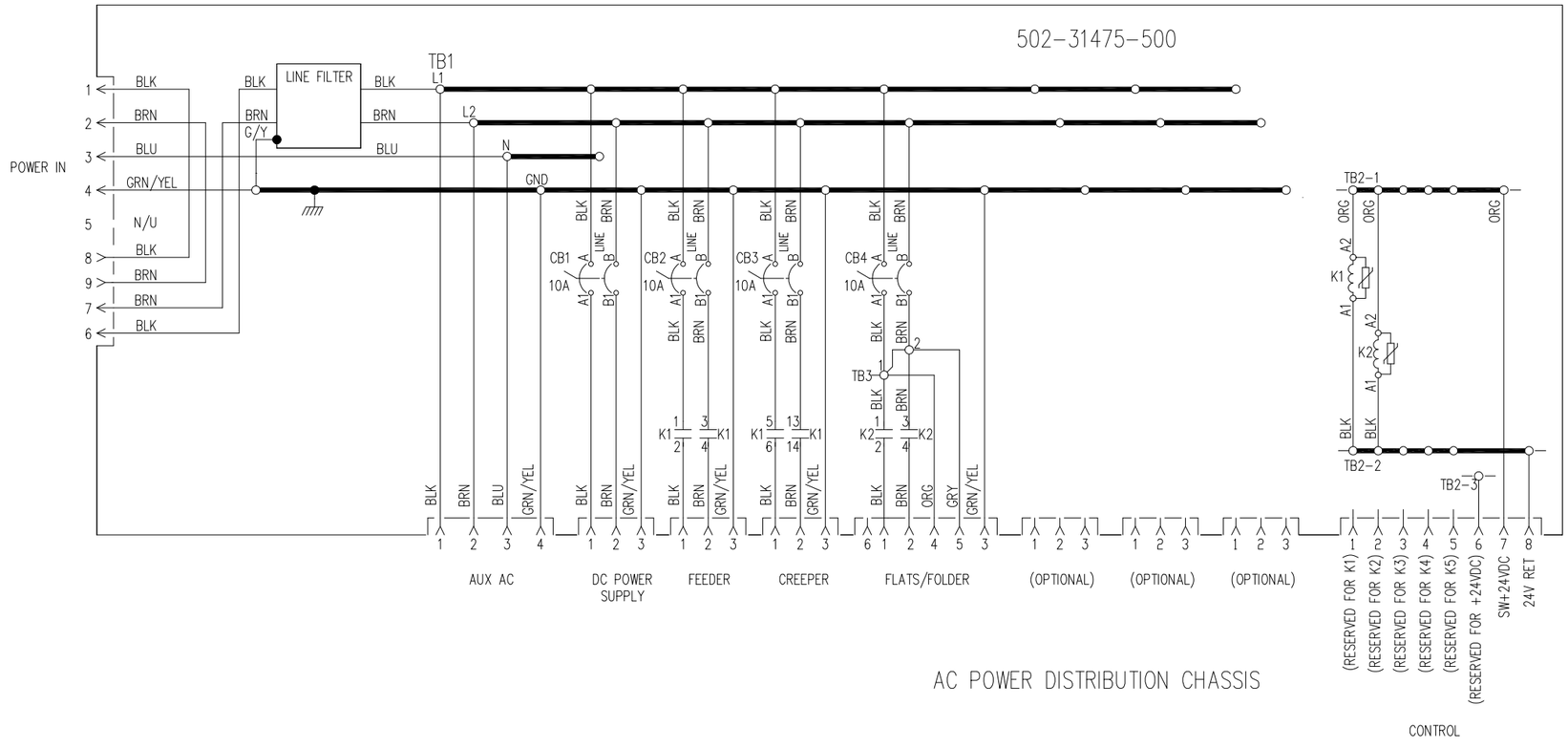
TEL: 860-526-9561

TITLE: AC POWER DISTRIBUTION CONTROL CABINET

SIZE	DWG NO.	
B	597-31570-301	
SCALE: 1:1		SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-302 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



AC POWER DISTRIBUTION CHASSIS

MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B

ORIGINAL APPLICATION

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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GBR SYSTEMS CORPORATION
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TEL: 860-526-9561

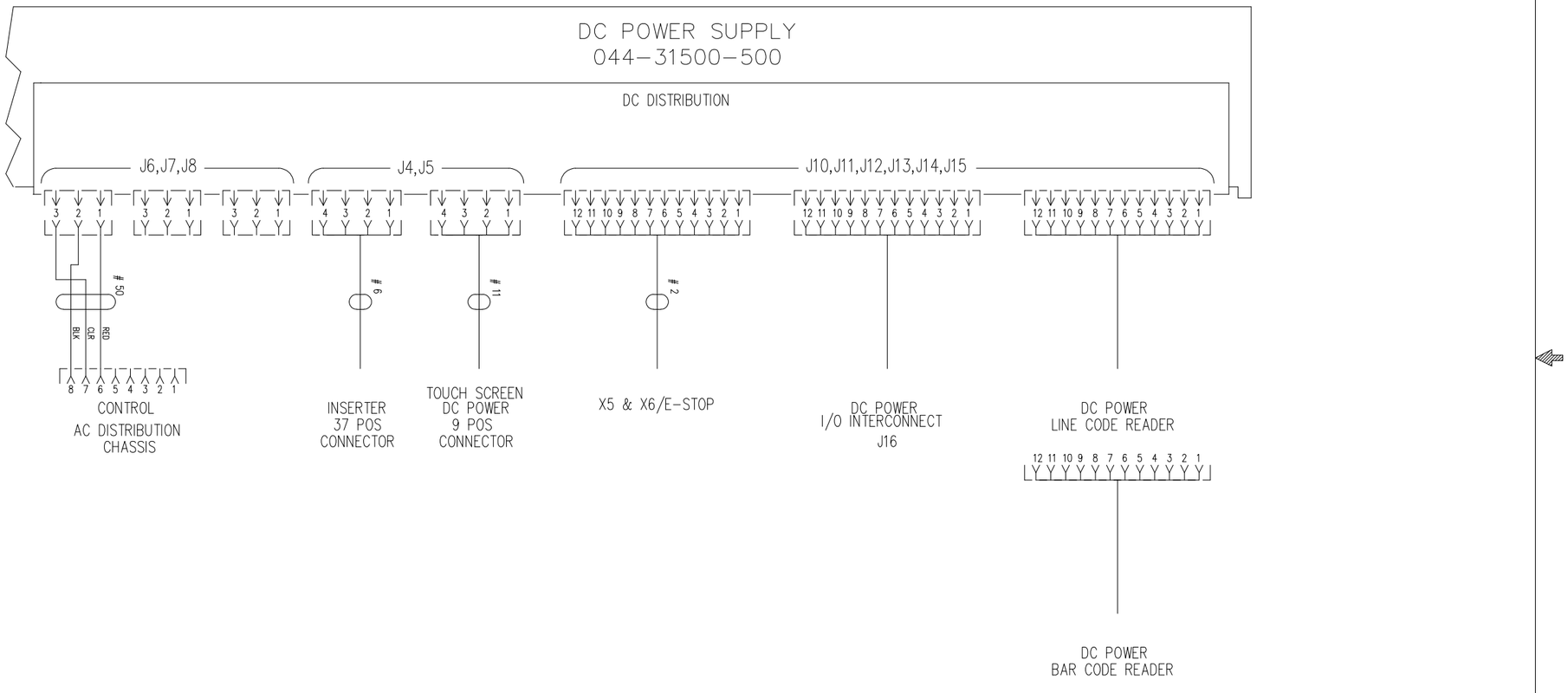
TITLE
AC POWER DISTRIBUTION
CHASSIS 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-302

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-303 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B
ORIGINAL APPLICATION	

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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GBR SYSTEMS CORPORATION
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TEL: 860-526-9561

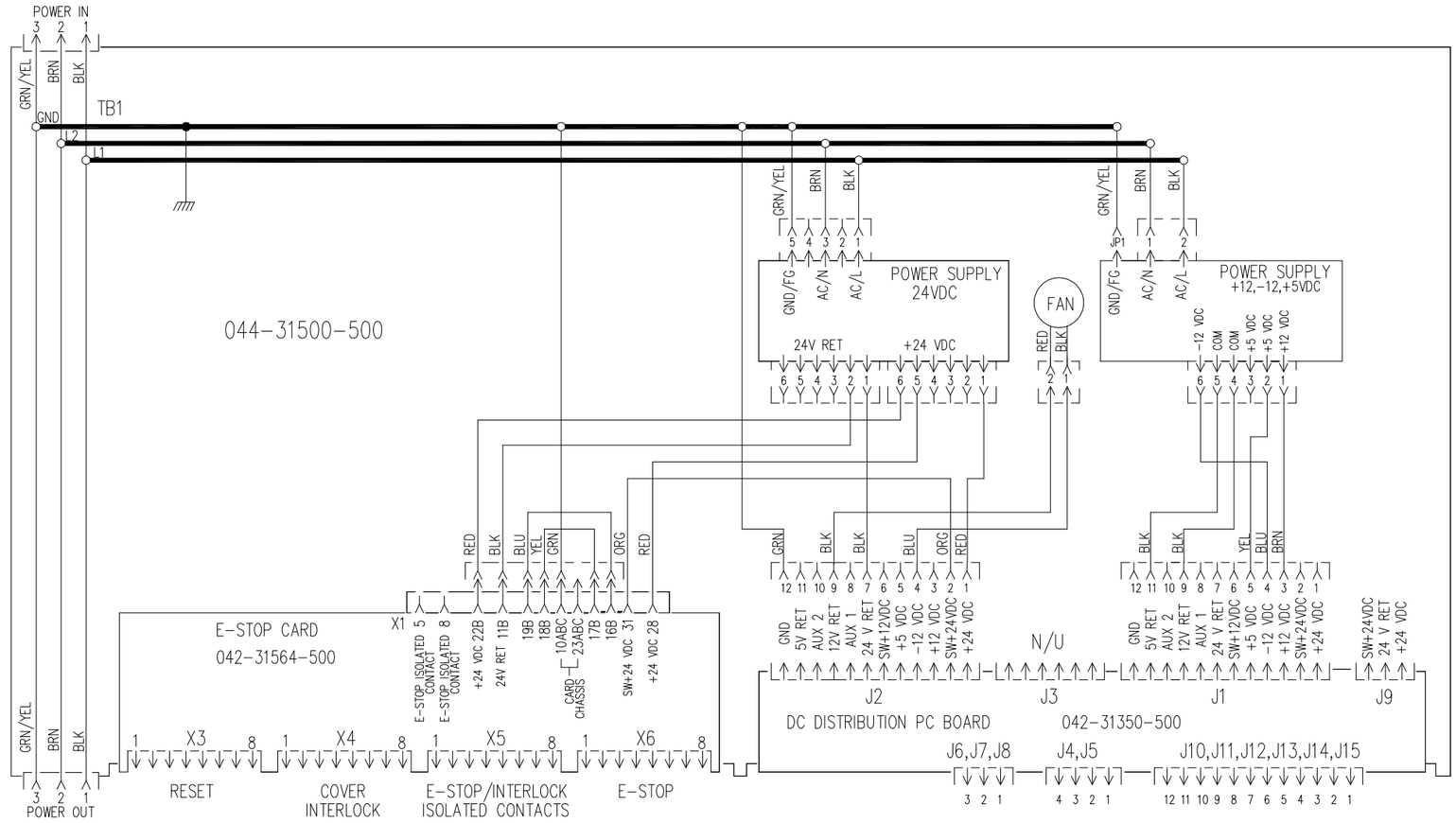
TITLE
DC POWER DISTRIBUTION
CONTROL CABINET V4 ELECT.

SIZE B | DWG NO. 597-31570-303

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-304 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #		
FNSH: #		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°		438B
	NEXT ASSY	USED ON
	ORIGINAL APPLICATION	
REMOVE BURRS, SHARP EDGES & CORNERS	DRAWN E. HARRIS	2/7/2006
	CHECKED	
THIRD ANGLE PROJECTION	APVL.	

INTERPRET DRAWING PER ANSI Y14.5

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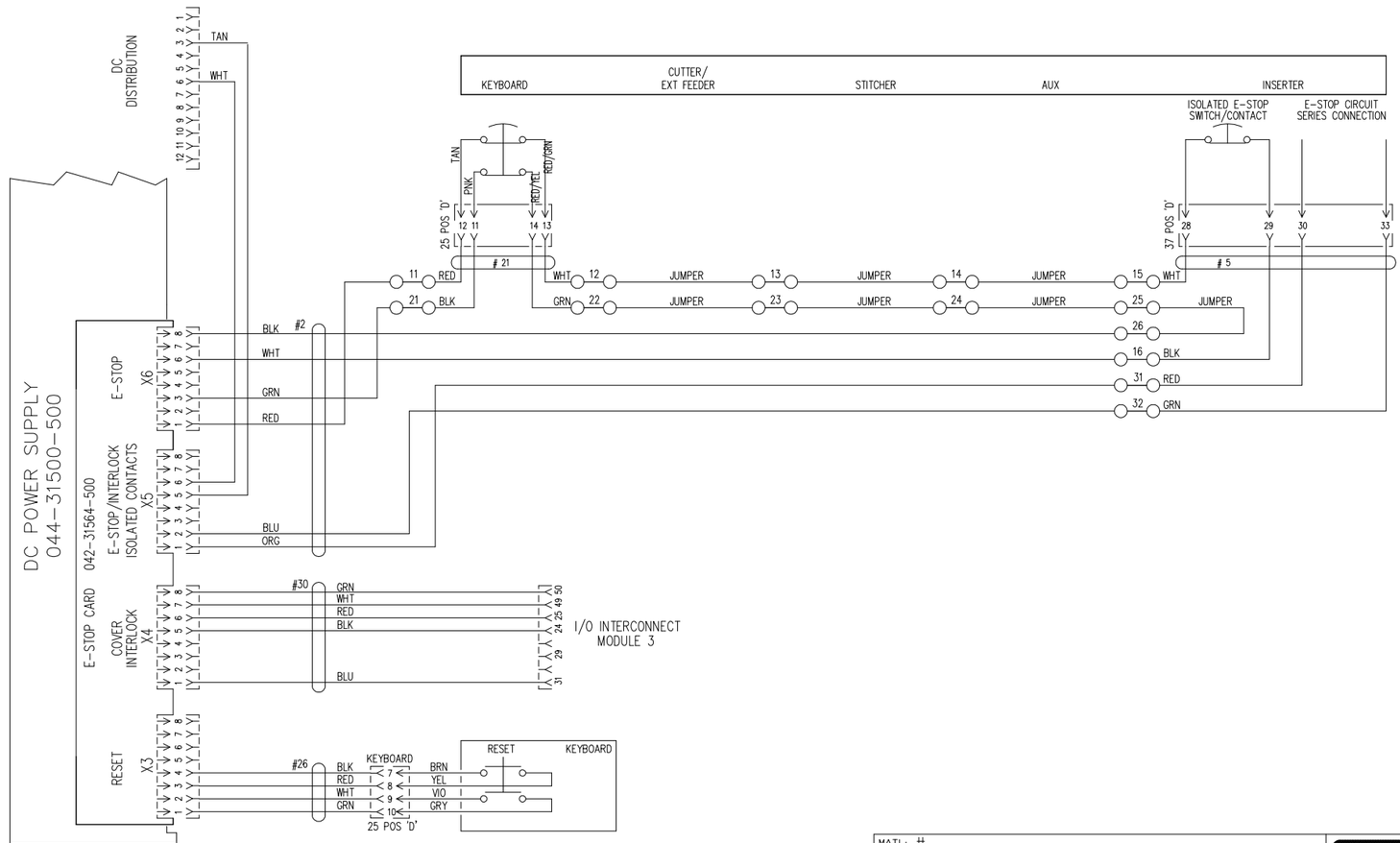
TEL: 860-526-9561

TITLE: DC POWER DISTRIBUTION, CHASSIS V4 ELECT.

SIZE B | DWG NO. 597-31570-304 | SCALE: 1:1 | SHEET 1 OF 1

SIZE	DWG NO.	SH
B	597-31570-305	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #	
FNSH: #	
UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°	438B
	NEXT ASSY / USED ON
	ORIGINAL APPLICATION
REMOVE BURRS, SHARP EDGES & CORNERS	DRAWN E. HARRIS 2/7/2006
	CHECKED
THIRD ANGLE PROJECTION	APVL.
INTERPRET DRAWING PER ANSI Y14.5	

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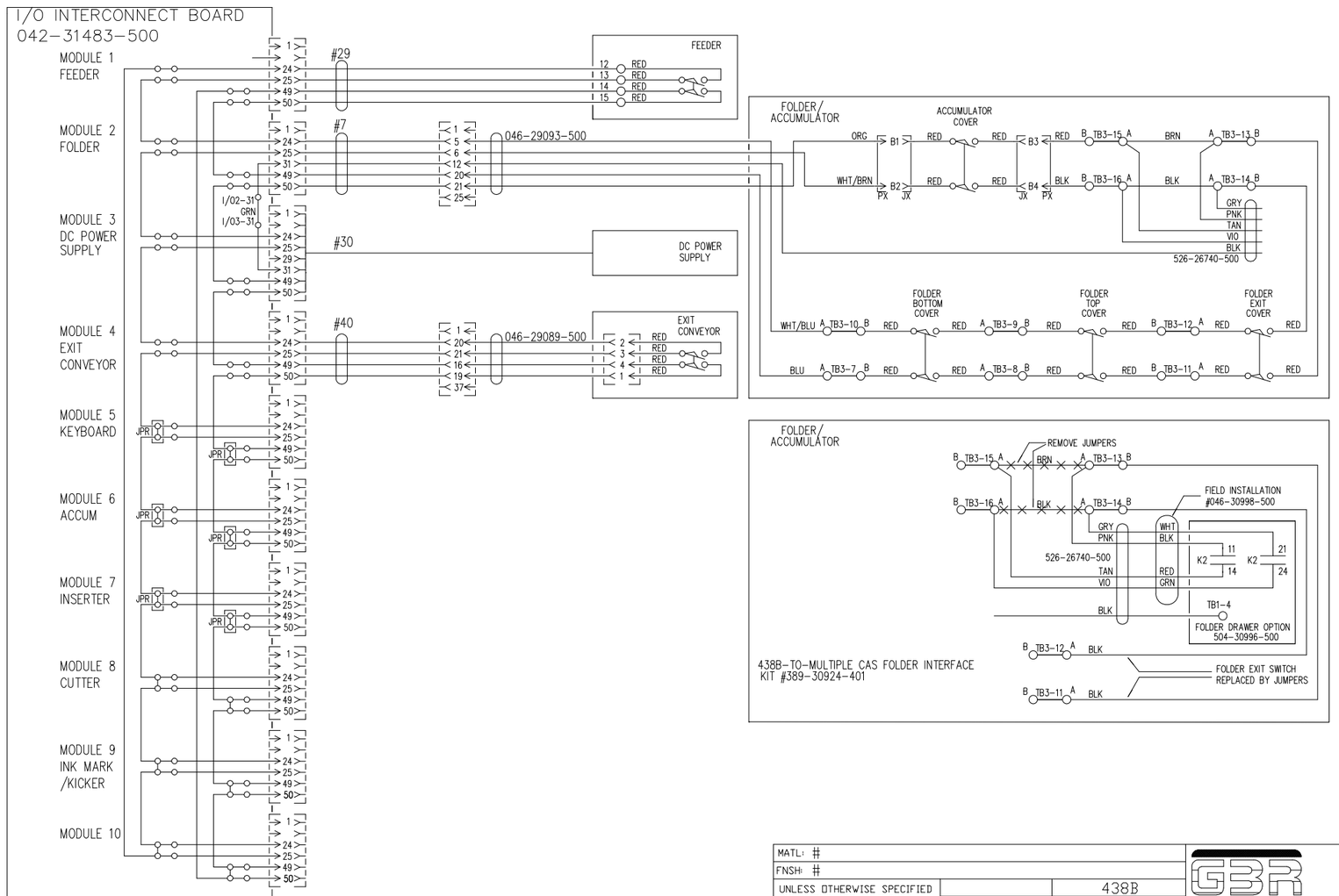
GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE: E-STOP & INTERLOCK

SIZE	DWG NO.	SCALE	SHEET
B	597-31570-305	1:1	1 OF 2

SIZE B | DWG NO. 597-31570-305 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ` 2~

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

438B

NEXT ASSY | USED ON

ORIGINAL APPLICATION

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

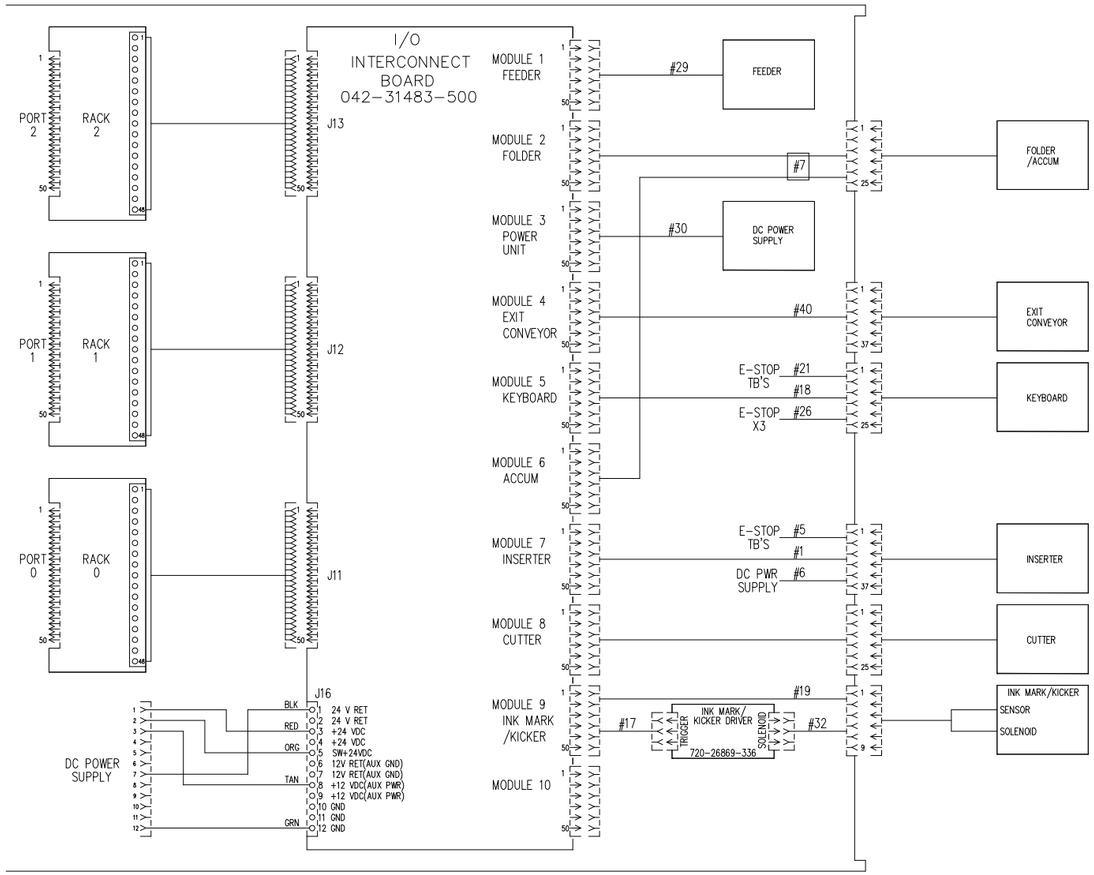
TITLE: E-STOP & INTERLOCK

SIZE B | DWG NO. 597-31570-305

SCALE: 1:1 | SHEET 2 OF 2

SIZE B | DWG NO. 597-31570-306 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
438B	
ORIGINAL APPLICATION	
DRAWN E. HARRIS	2/7/2006
CHECKED	
APVL.	

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12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE
, I/O INTERCONNECT, 438 V4 ELECT.

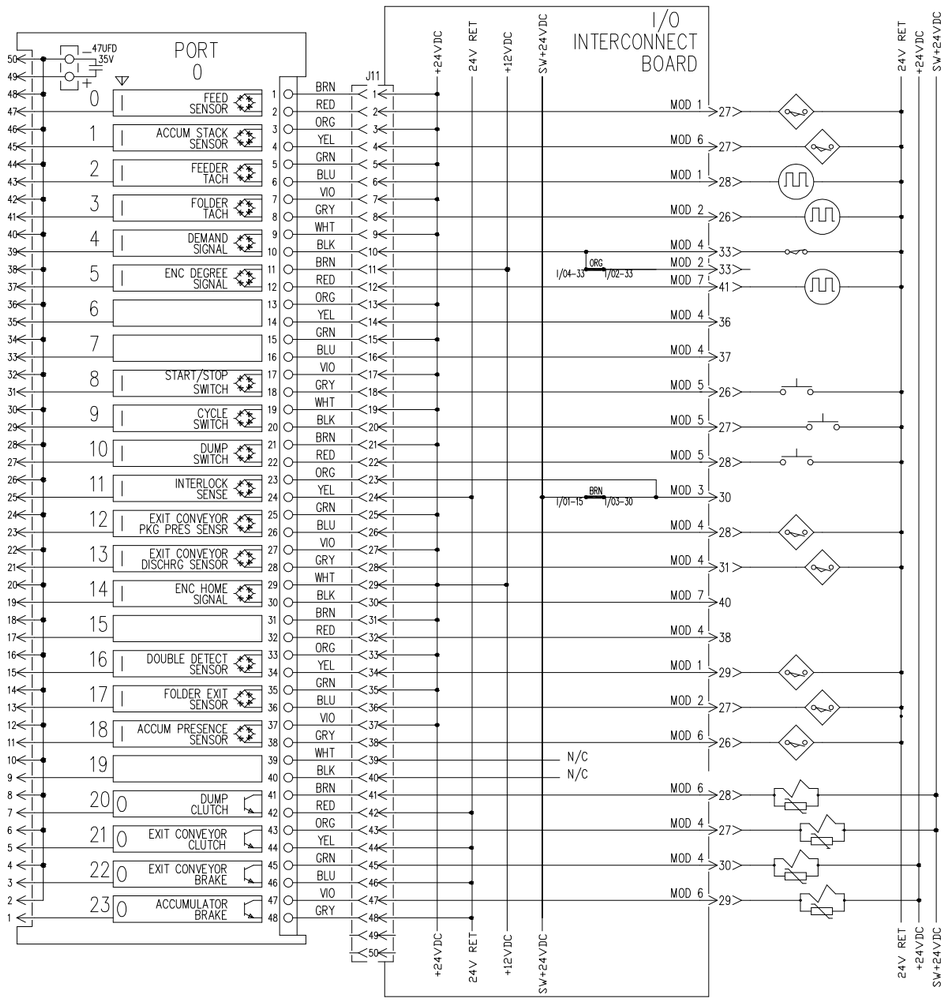
SIZE B | DWG NO. 597-31570-306

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-307 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH

042-31483-500



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

	438B
NEXT ASSY	USED ON
ORIGINAL APPLICATION	
DRAWN E. HARRIS	2/7/2006
CHECKED	
APVL.	

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GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

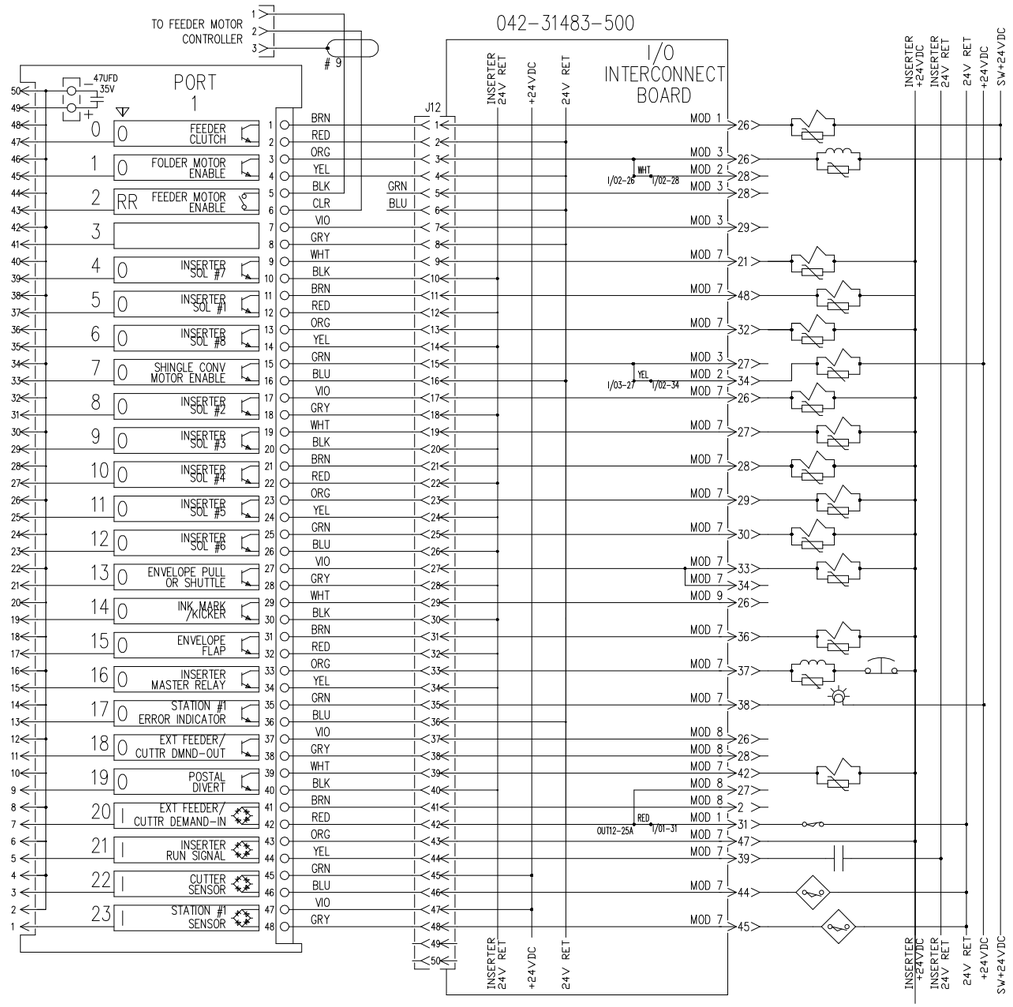
TITLE: I/O INTERCONNECT, RACK PORT 0

SIZE B | DWG NO. 597-31570-307

SCALE: 1:1 | SHEET 1 OF 1

SIZE	DWG NO.	SH
B	597-31570-308	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #	
FNSH: #	
UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°	438B
REMOVE BURRS, SHARP EDGES & CORNERS	NEXT ASSY / USED ON
THIRD ANGLE PROJECTION	ORIGINAL APPLICATION
INTERPRET DRAWING PER ANSI Y14.5	DRAWN E. HARRIS 2/7/2006
	CHECKED
	APVL.

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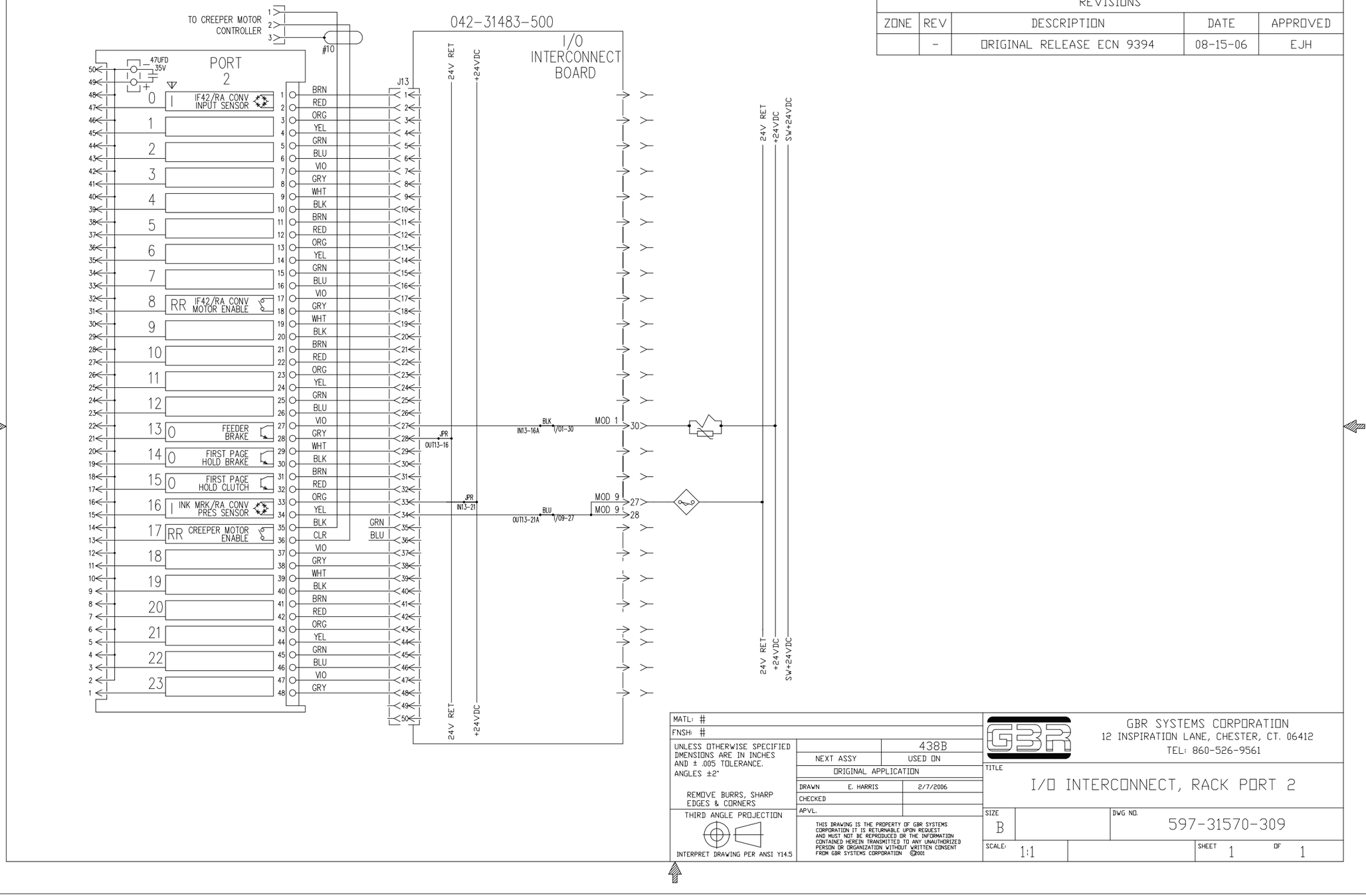
TEL: 860-526-9561

TITLE			
I/O INTERCONNECT, RACK PORT 1			
SIZE		DWG NO.	
B		597-31570-308	
SCALE: 1:1		SHEET 1 OF 1	

SIZE B | DWG NO. 597-31570-309 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B

ORIGINAL APPLICATION

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

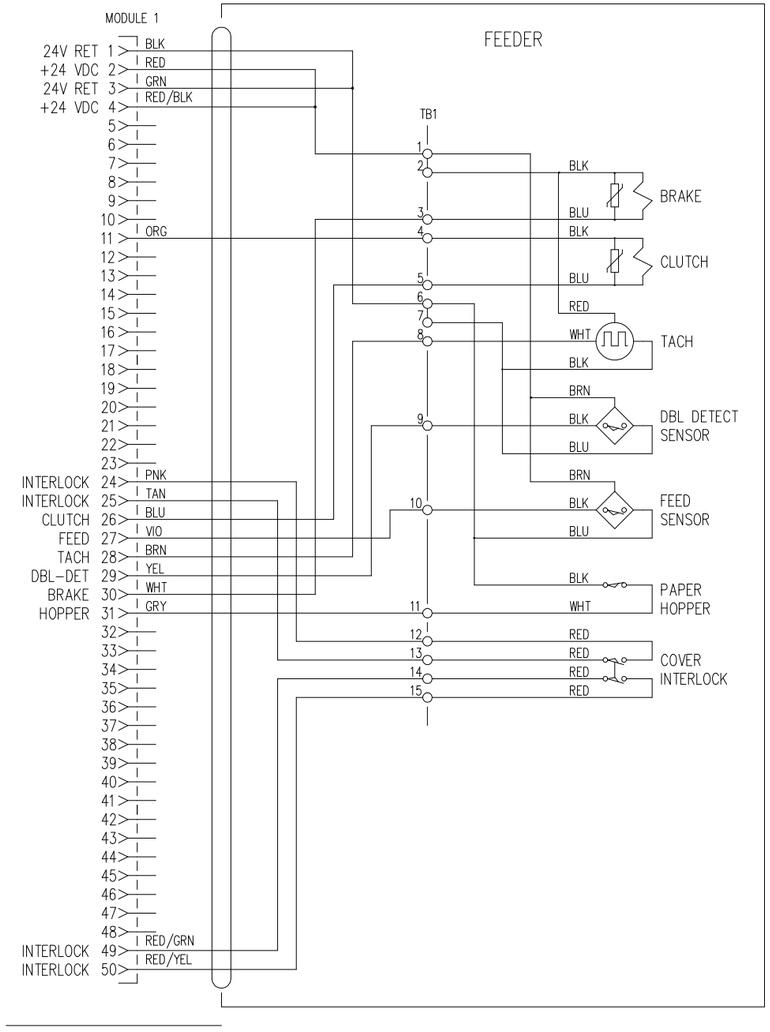
TITLE: I/O INTERCONNECT, RACK PORT 2

SIZE B | DWG NO. 597-31570-309

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-310 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

438B

NEXT ASSY | USED ON

ORIGINAL APPLICATION

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE: I/O FEEDER MODULE 1

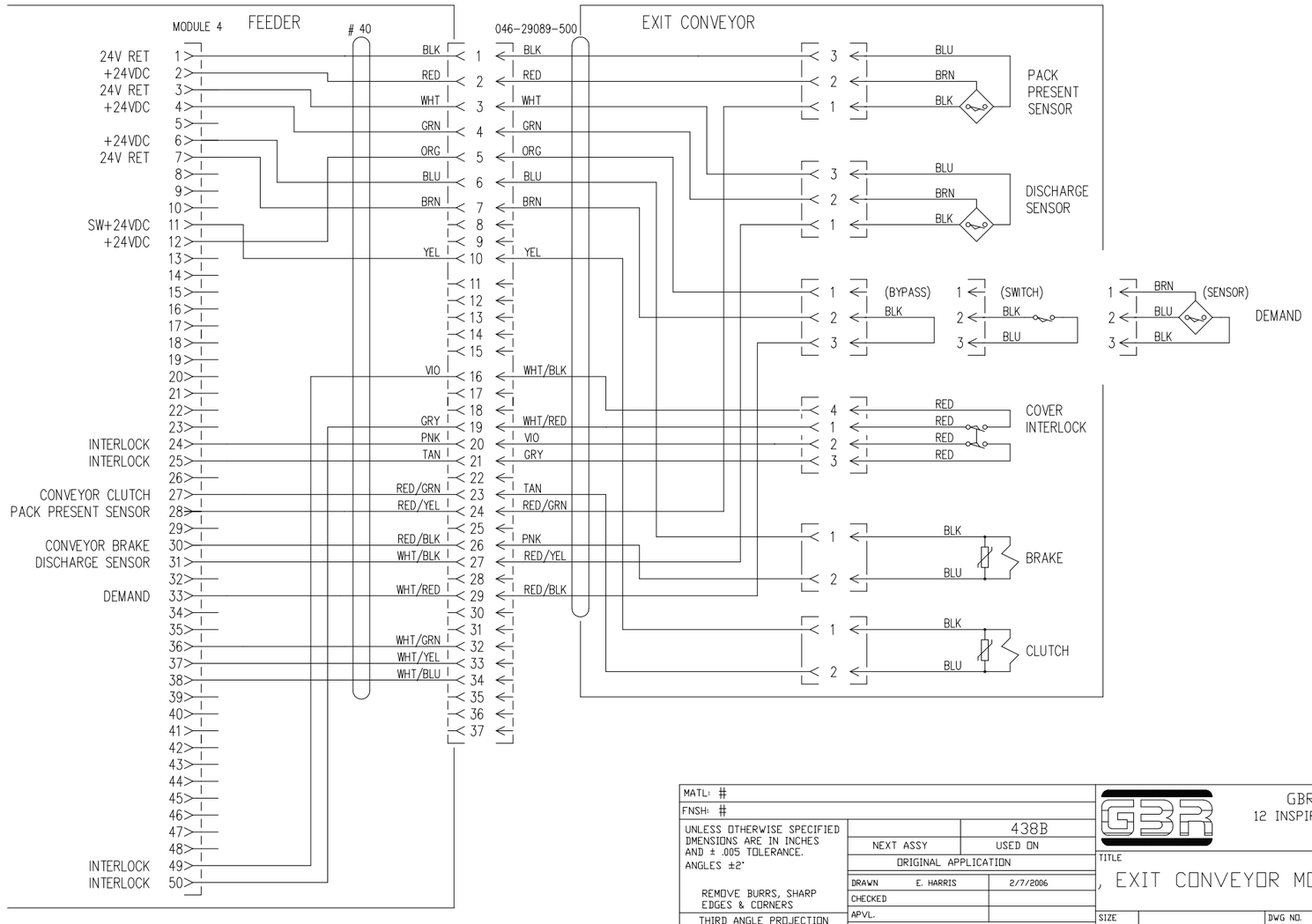
SIZE: B | DWG NO. 597-31570-310

SCALE: 1:1 | SHEET 1 OF 1

view

SIZE B | DWG NO. 597-31570-311 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
438B	
ORIGINAL APPLICATION	

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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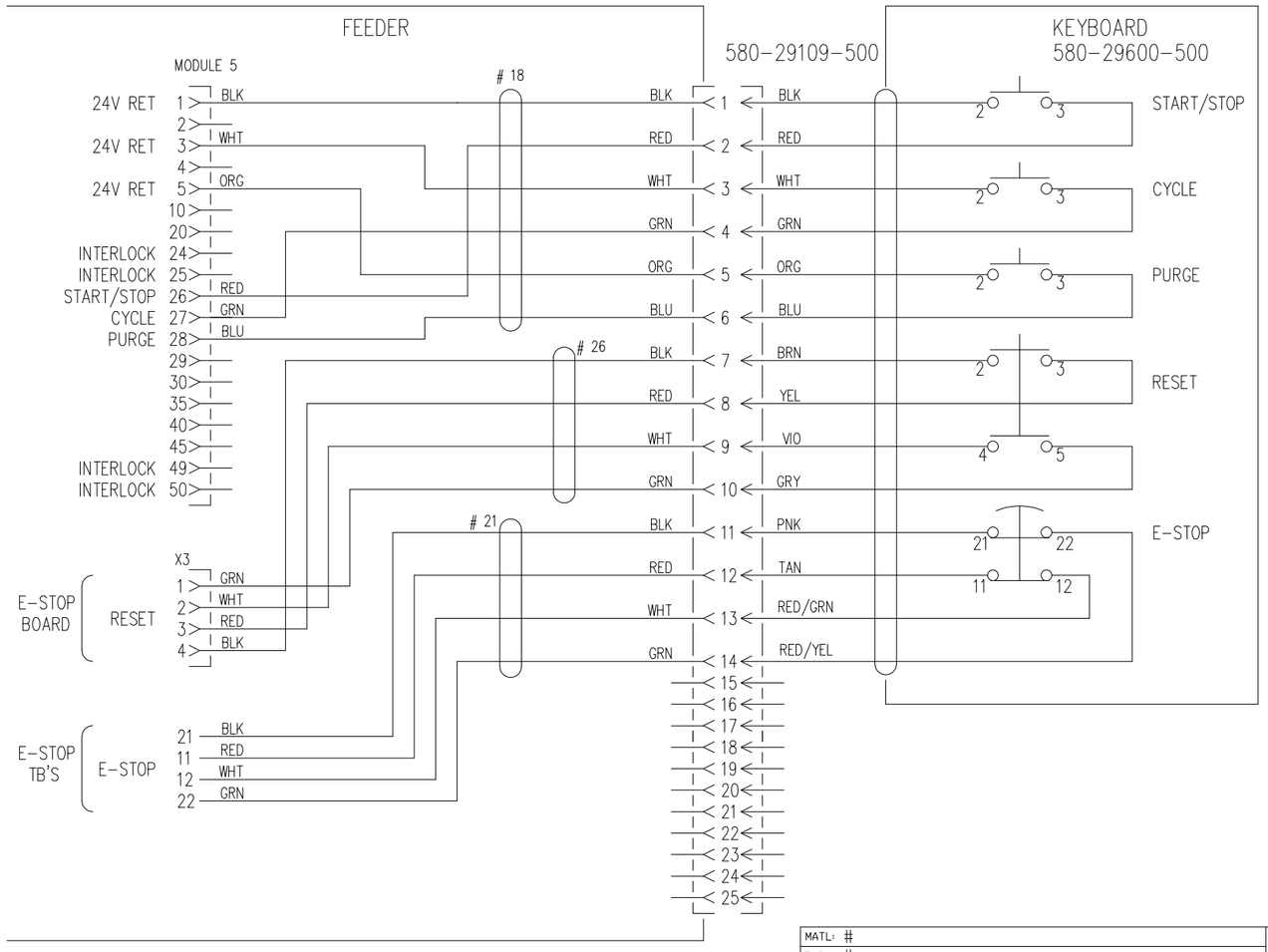
TEL: 860-526-9561

TITLE: , EXIT CONVEYOR MODULE 4, 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-311 | SCALE: 1:1 | SHEET 1 OF 1

SIZE	DWG NO.	SH
B	597-31570-312	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #	
FNSH: #	
UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°	
REMOVE BURRS, SHARP EDGES & CORNERS	
THIRD ANGLE PROJECTION	INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B
ORIGINAL APPLICATION	
DRAWN E. HARRIS	2/7/2006
CHECKED	
APVL.	

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12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

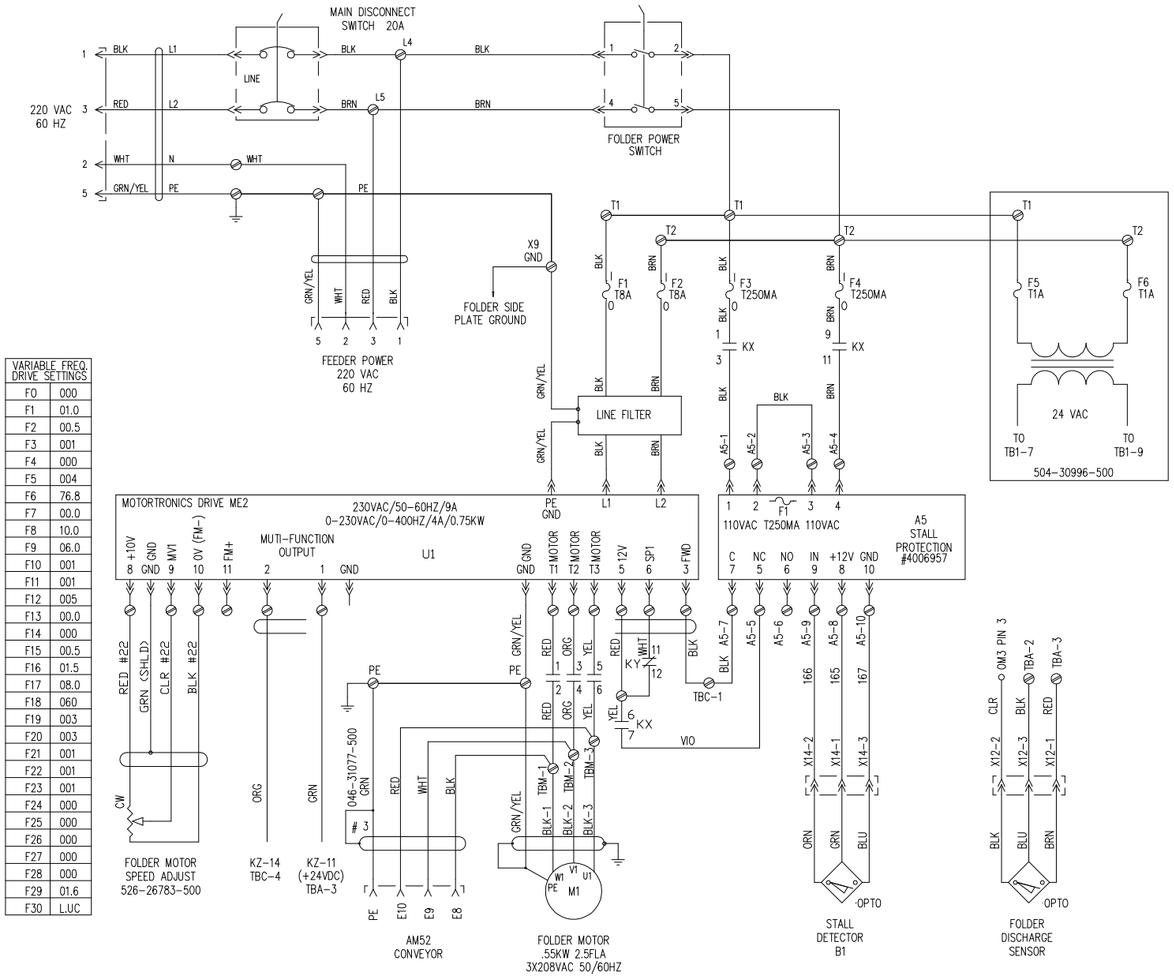
TITLE: KEYBOARD MODULE 5, 438 V4 ELECT.

SIZE	DWG NO.
B	597-31570-312

SCALE:	SHEET	OF
1:1	1	1

SIZE B | DWG NO. 597-31570-313 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



VARIABLE FREQ. DRIVE SETTINGS	
F0	000
F1	01.0
F2	00.5
F3	001
F4	000
F5	004
F6	76.8
F7	00.0
F8	10.0
F9	06.0
F10	001
F11	001
F12	005
F13	00.0
F14	000
F15	00.5
F16	01.5
F17	08.0
F18	060
F19	003
F20	003
F21	001
F22	001
F23	001
F24	000
F25	000
F26	000
F27	000
F28	000
F29	01.6
F30	L.UC

NOTE:
1) WHILE PROGRAMMING THE MOTORTRONICS DRIVE CONTROLLER REMOVE KY RELAY. REFER TO THE OPERATORS MANUAL FOR THE SET UP PROCEDURE.

MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B
ORIGINAL APPLICATION	

DRAWN	E. HARRIS	2/7/2006
CHECKED		
APVL.		

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12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

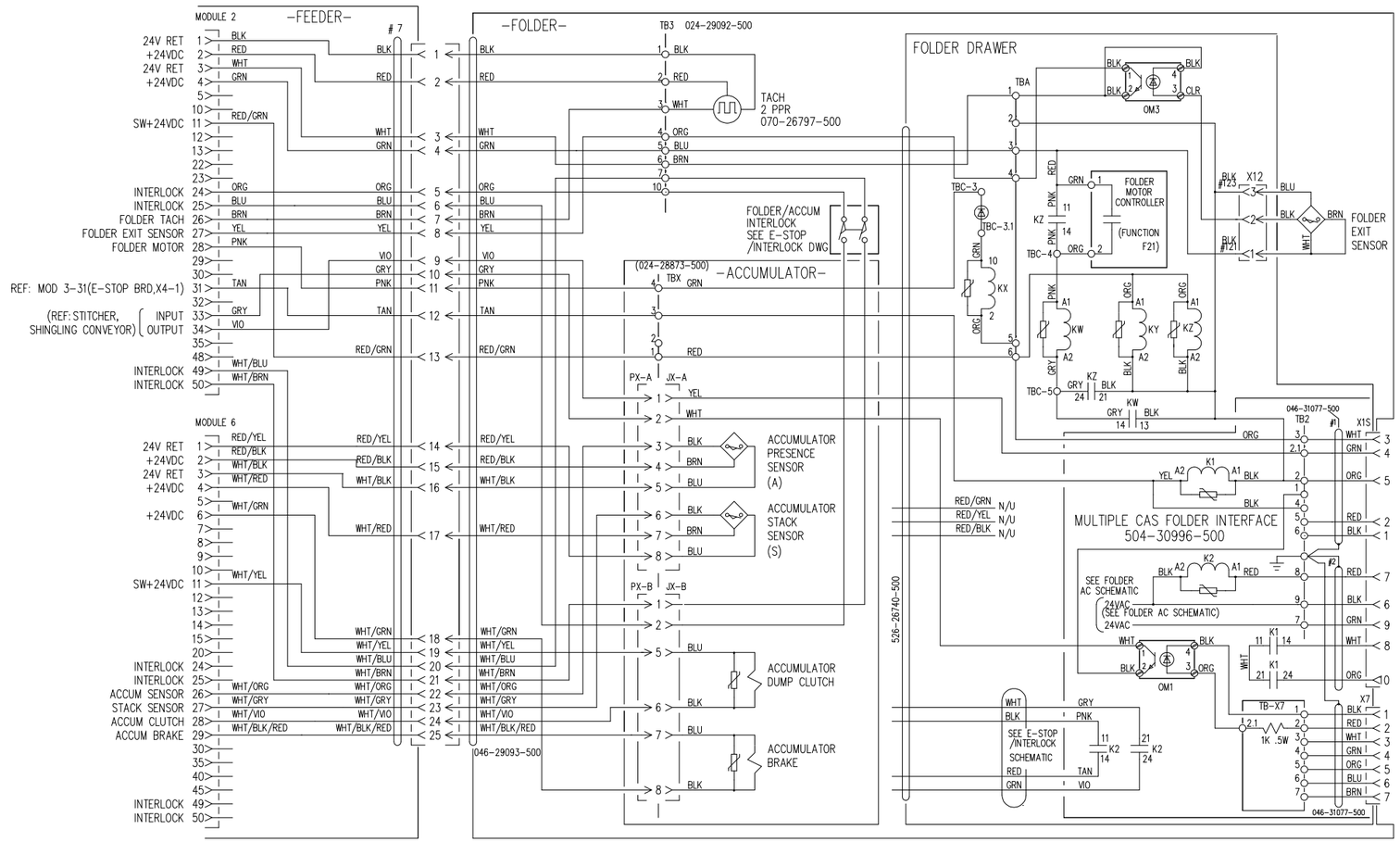
TITLE
FOLDER/ACCUMULATOR AC POWER DISTRIBUTION, 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-313

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-314 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #		GBR SYSTEMS CORPORATION 12 INSPIRATION LANE, CHESTER, CT. 06412 TEL: 860-526-9561
FNSH: #		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2° REMOVE BURRS, SHARP EDGES & CORNERS THIRD ANGLE PROJECTION INTERPRET DRAWING PER ANSI Y14.5	NEXT ASSY: 438B USED ON: ORIGINAL APPLICATION DRAWN: E. HARRIS 2/7/2006 CHECKED APVL.	TITLE: FOLDER/ACCUMULATOR CONTROL, 438 V4 ELECT. SIZE: B DWG NO.: 597-31570-314 SCALE: 1:1 SHEET 1 OF 1

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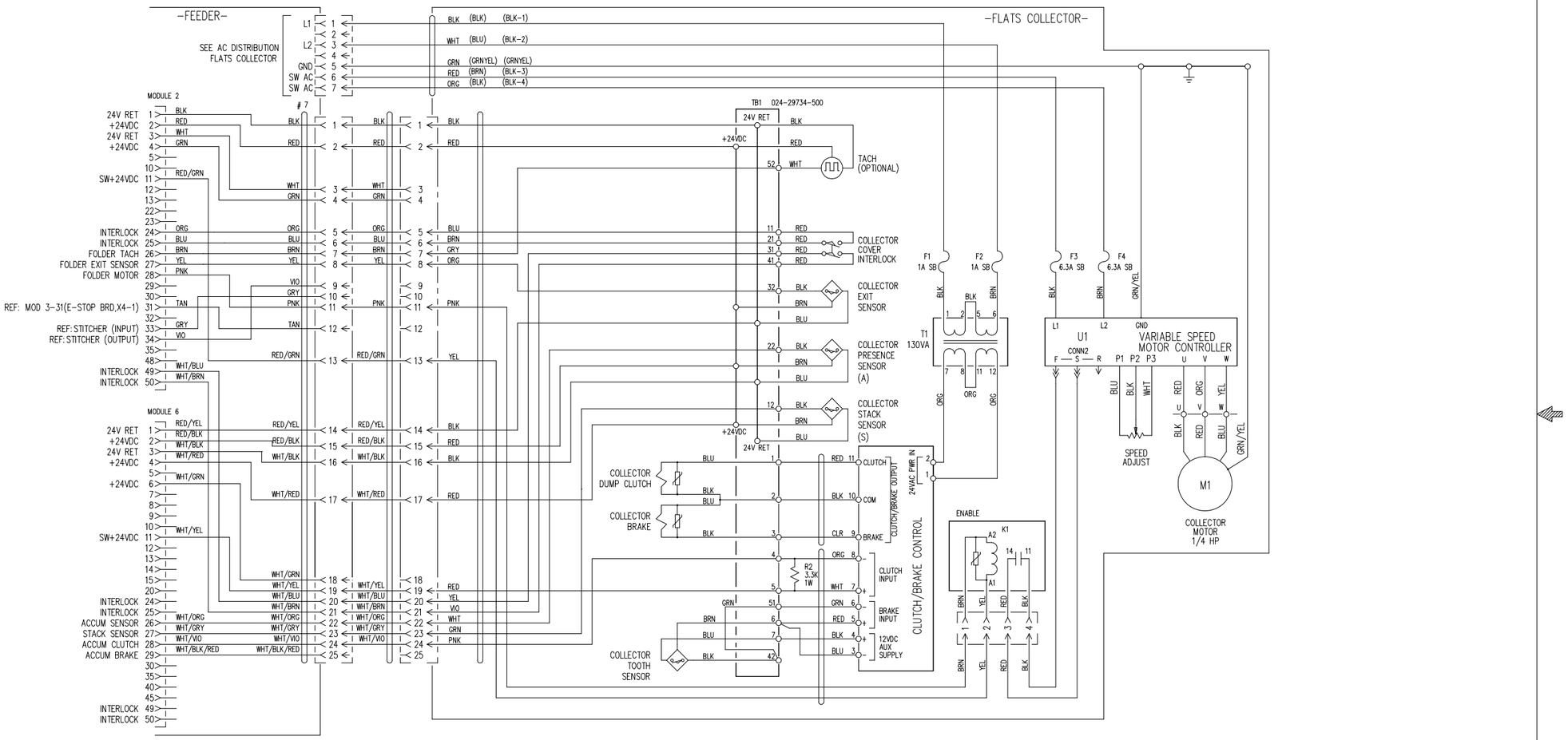
SIZE B | DWG NO. 597-31570-315 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE. ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
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ORIGINAL APPLICATION	
DRAWN E. HARRIS	2/7/2006
CHECKED	
APVL.	

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TEL: 860-526-9561

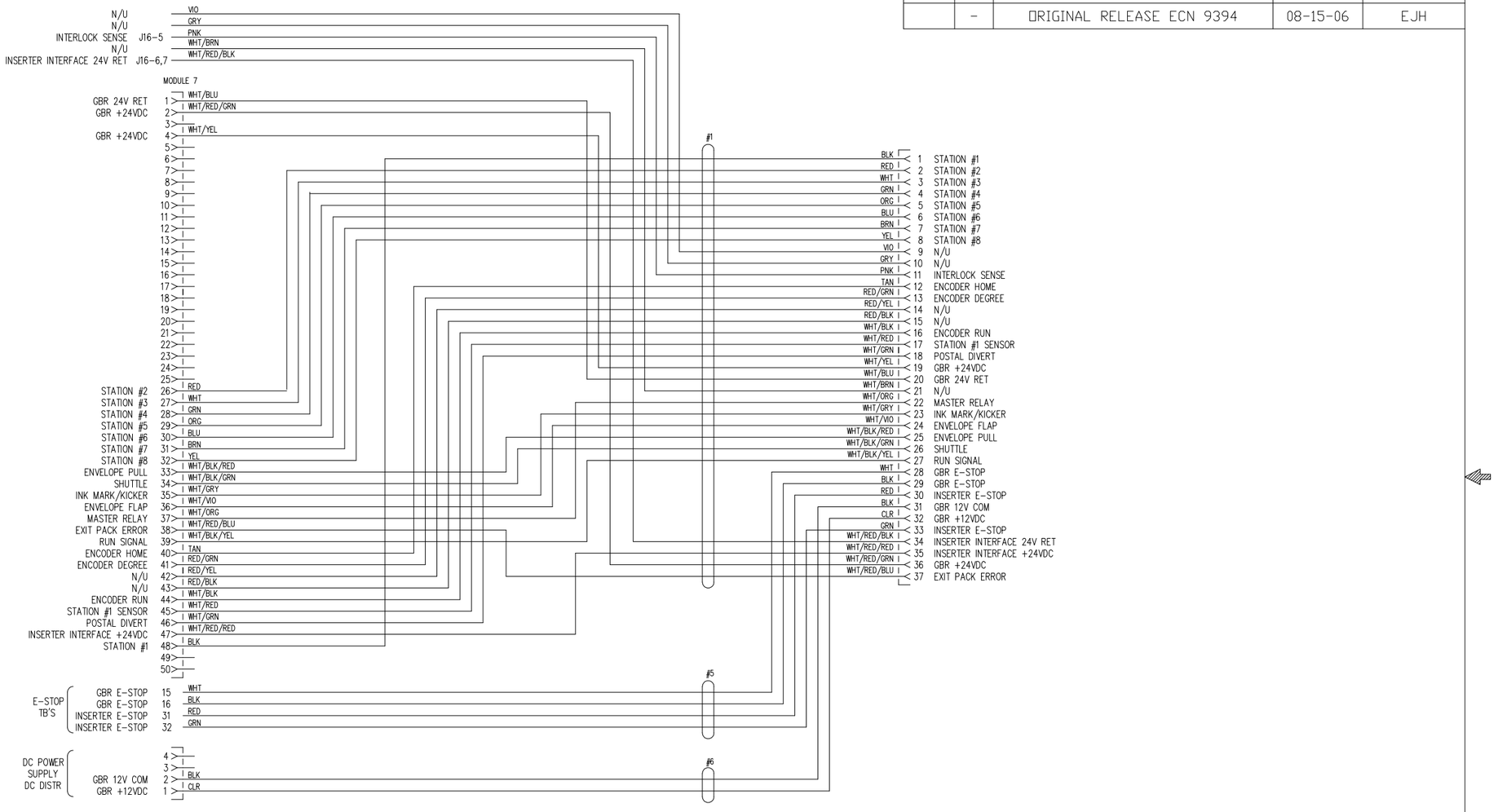
TITLE: FLATS COLLECTOR CONTROL, 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-315

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-316 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #

FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
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ORIGINAL APPLICATION	
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TEL: 860-526-9561

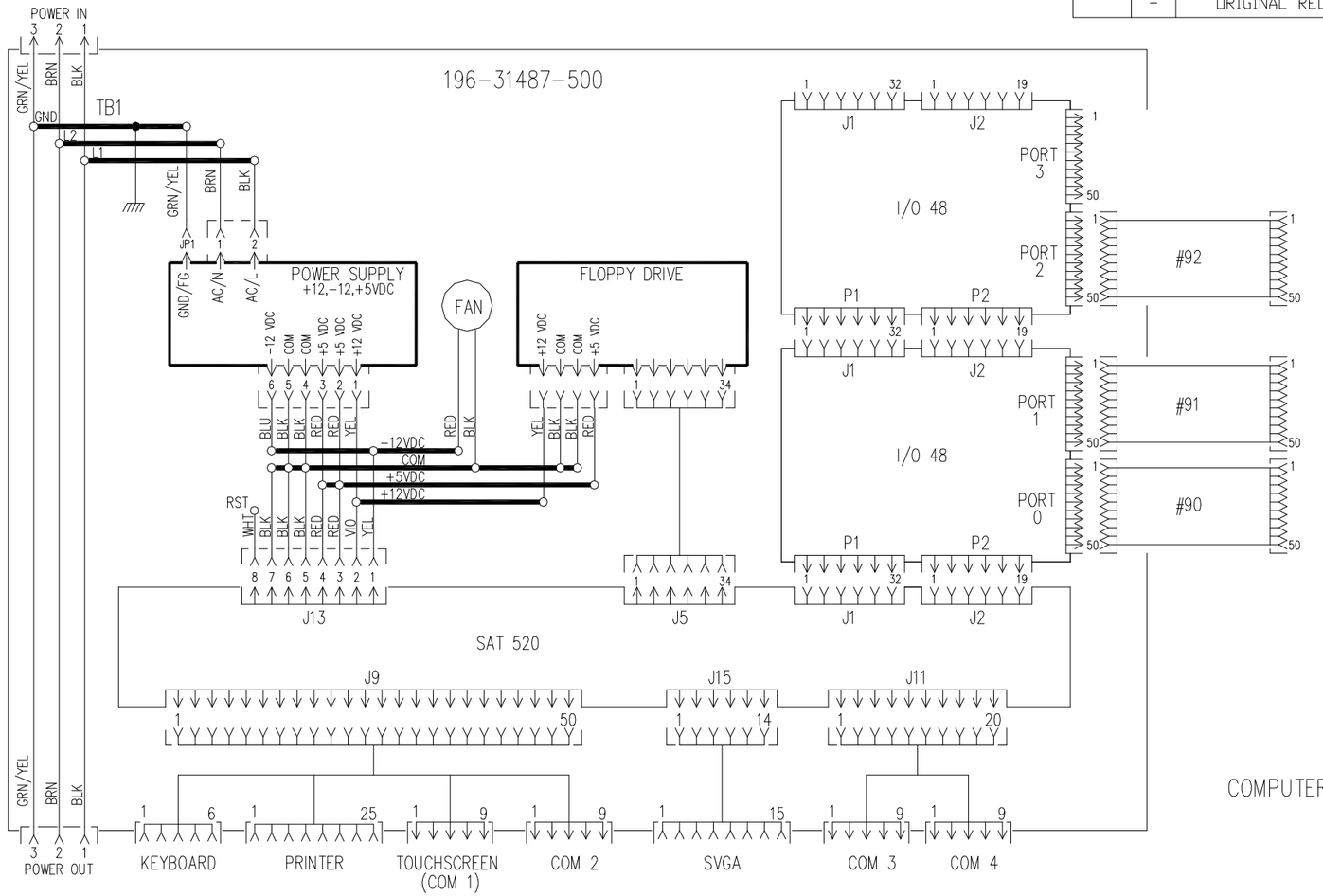
TITLE: INSERTER MODULE 7, 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-316

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-317 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



COMPUTER CHASSIS

MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
ORIGINAL APPLICATION	438B
DRAWN E. HARRIS	2/7/2006
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GBR SYSTEMS CORPORATION
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TEL: 860-526-9561

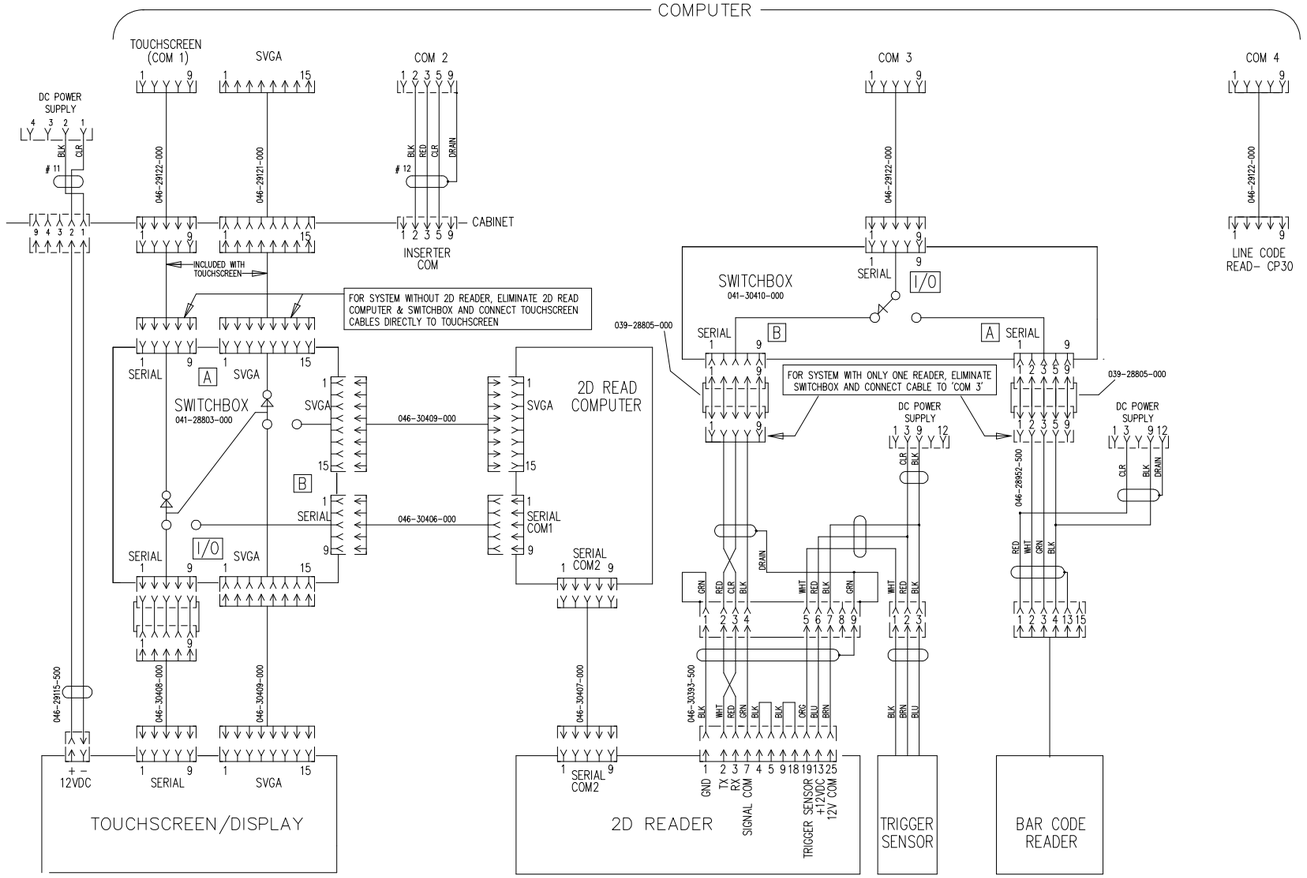
TITLE: SAT 520 CPU CHASSIS, 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-317

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-318 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #

FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B

ORIGINAL APPLICATION

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TEL: 860-526-9561

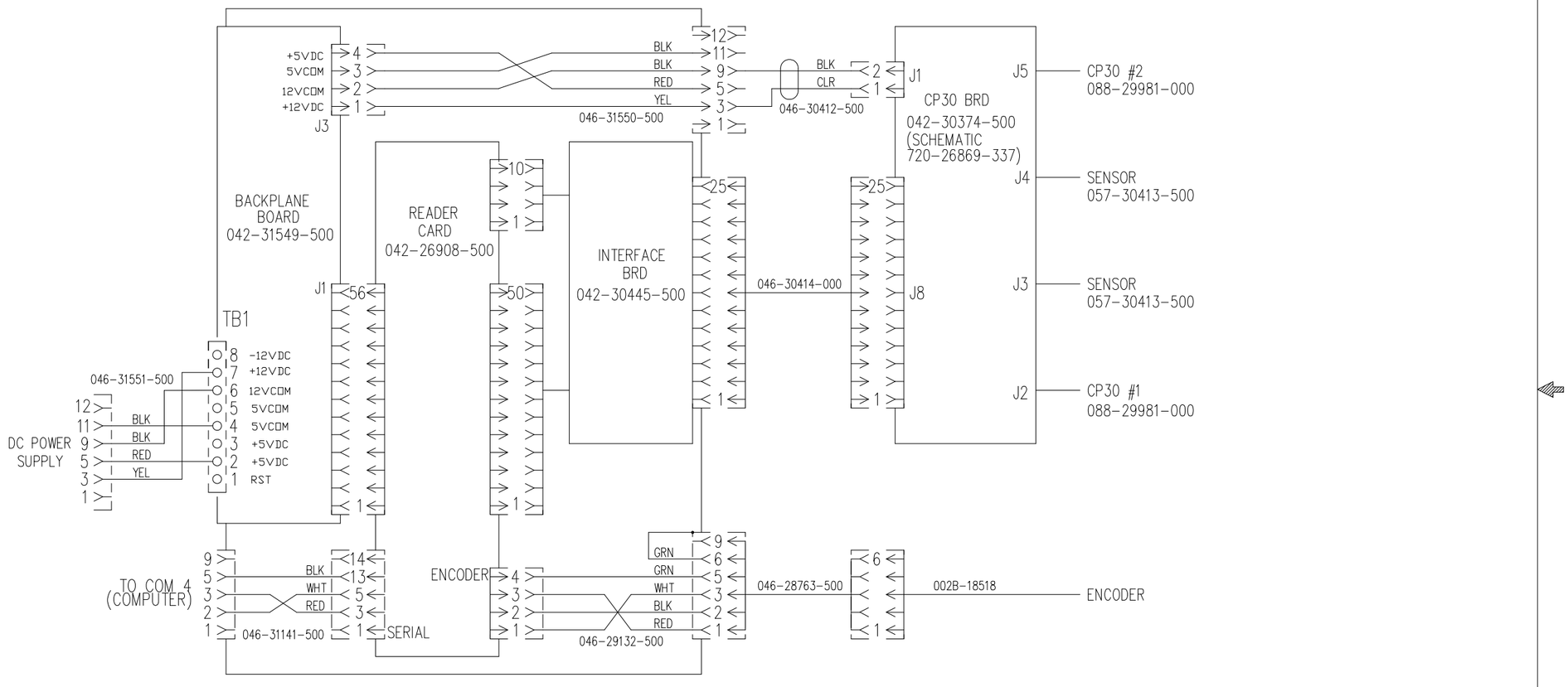
TITLE: SAT 520 CPU WITH TOUCH AND READ SYSTEM, 438 V4 ELECT.

SIZE B | DWG NO. 597-31570-318

SCALE: 1:1 | SHEET 1 OF 1

SIZE B | DWG NO. 597-31570-319 | SH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	-	ORIGINAL RELEASE ECN 9394	08-15-06	EJH



MATL: #
FNSH: #

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ± .005 TOLERANCE.
ANGLES ±2°

REMOVE BURRS, SHARP EDGES & CORNERS

THIRD ANGLE PROJECTION

INTERPRET DRAWING PER ANSI Y14.5

NEXT ASSY	USED ON
	438B

ORIGINAL APPLICATION

DRAWN	E. HARRIS	2/7/2006
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GBR SYSTEMS CORPORATION
12 INSPIRATION LANE, CHESTER, CT. 06412
TEL: 860-526-9561

TITLE: , LINE CODE READ, CP30, 438 V4 ELECT.

SIZE	DWG NO.	
B	597-31570-319	

SCALE: 1:1 SHEET 1 OF 1

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D.1 GENERAL SOLUTIONS TO ERRORS

Many error codes are the result of jammed paper (physical errors), or paper expected at specific time and location (read errors: sequence, blank page, misprinted code, etc.).

The sensors index the number of sheets as they pass, incrementing a count on the CPU-586. If a corresponding decrement of count does not occur from the next sensor, a read error is generated. If error persists, consider failure of sensor or communication problem (poor connection, etc.).

For many read errors, check that setup parameters are correct before pursuing functional troubleshooting.

Read errors require a determination of the integrity of the pack. The operator must look at the readings on the display and manually verify each sheet.

When read errors occur, it indicates the integrity of the package is in question. The 438 was not able to verify a page while stream feeding a package. When the operator is satisfied the package is complete, press the DUMP key to release the package.

Once a reading error (BLANK or MISREAD) is declared, additional feeding via the CYCLE key will continue to display BLANK or MISREAD errors, but will not stop the machine.

Before powering up the 438, the operator must remove any packages in the accumulator to be sure there will be no initial error conditions.

For electrical type problems, always check the on-off switches as they are also circuit breakers. There are LED's on the board that the Input/Output modules are plugged into that will help isolate many problems (refer to the I/O 96 Board description in Section D.5).

Solutions to Less Common Errors

A rare, but more difficult-to-find problem can occur with shorts in the 24VDC circuit. Intermittent failure of sensors (5VDC supply) can result from the 24VDC short. The short will only occur when a 24V component activates, dropping the 5V supply across the line. The 24V solenoid may be located some distance from the sensor which is the apparent problem: consider what is supposed to happen before or when the sensor sees the paper.

If either the Feeder speed or Folder speed are approximately half of the other, an encoder channel is probably lost. (Check speeds through Test menu on display.)

Any time a new CPU-586 board is installed, the presets must be reset, or there will be an error displayed.

If PWB errors occur (errors with PWB as probable source), pull the board and make sure that all board components are properly seated. Re-install the board and make sure it is properly seated.

If reader problems are recurring, re-calibrate with the calibration sheet. Feed the sheet through several times to ensure that the reader encoder is returning good data. If data is inconsistent, replace the reader encoder.

An “invalid calibration” error indicates that the calibration reading was more than 15% different from the expected (stored) result.

D.2 INITIAL ACTIONS

Ask the operator to describe or demonstrate the problem. Request all information on the failure. If there is an error message, refer to the index for guidance to appropriate Repair Correction Procedures. Some features of the machine may not be tested during the system checks and therefore, operator input will be a valuable asset to help diagnose the total system.

If the problem is the result of improper operator action, refer the operator to the operator documentation or instruct the operator on the proper actions.

Switch the 438 AC power OFF.

Check all areas of the machine for paper or other obstructions (including inside the Folder). Remove any paper or obstructions and feed a sheet through the machine to confirm that alignment adjustments are correct.

Turn ON the 438, press RESET, then Start/Stop, and confirm the following:

- All drive belts are moving
- Sensors are not blocked or fouled
- Machine operating parameters set correctly
- Document inserted in paper hopper passes through and is properly folded

NOTE: If physical paper jams re-occur and mechanical adjustments are correct, escalate service. Potential trouble spots are numerous but include: worn or damaged parts; stretched drive belts; excess static.

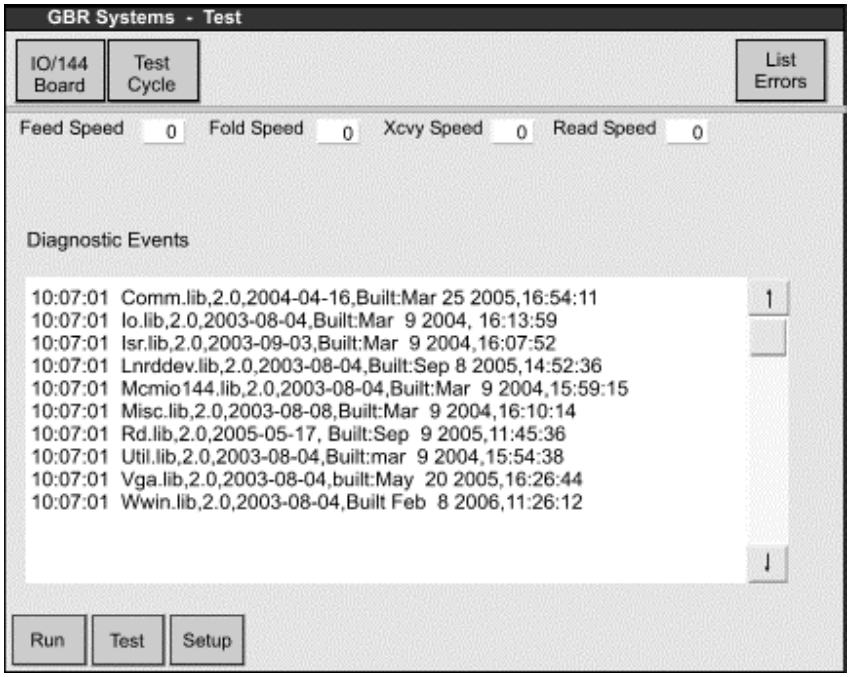
Verify all cable connections are properly mated, and all applicable sensor connections (as per application) are mated properly and not obstructed. In SETUP, verify that correct input parameters are selected.

Verify the Emergency Stop button is not actuated.

- Twist to reset
- Press RESET (blue switch)

D.4 "TEST" SCREEN OPERATION

Diagnosis of the system begins with these tests. If it is found that the displayed information indicates a problem, refer to the schematics in section D or section F.



D.4a Speed Test

Pressing the green "Power On" switch on the keyboard will start the feeder and folder motors and display the speeds of the feeder, folder, transfer conveyor, and read encoders.

D.4b Test Cycle

Press "Test Cycle" for 100 msec On/300 msec Off cycle.
Press "Test Cycle" again to stop test.

The speeds indicated are approximate (inches per second).

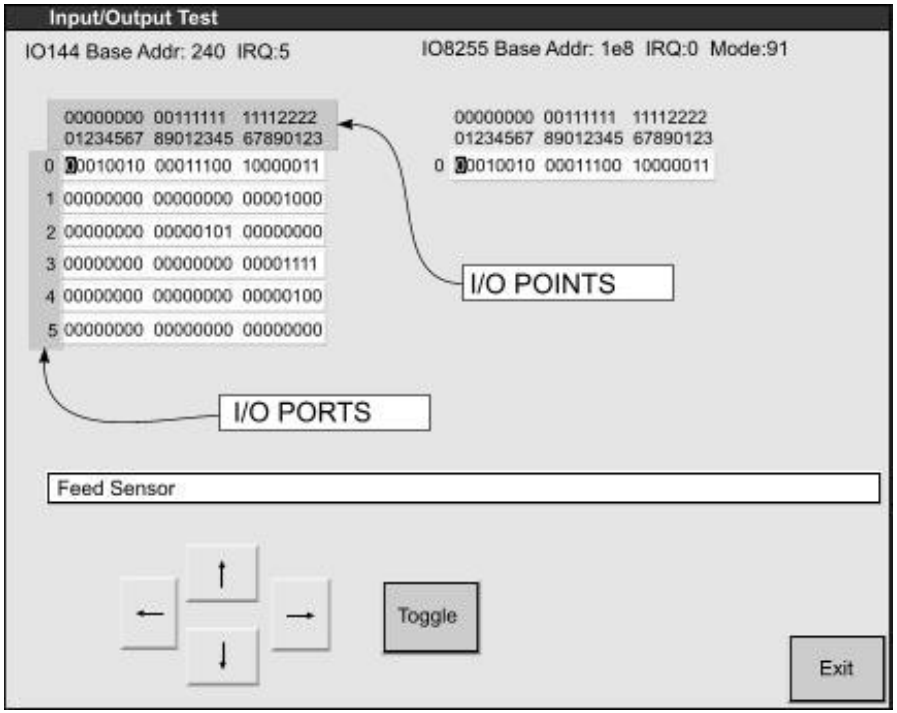
NOTE: The FEED and READ speeds must be within 5% of each other to ensure normal operational condition.

D.5 IO/96 BOARD (INPUTS AND OUTPUTS)

D.5a Orientation

Use this screen to test inputs and outputs:

- Press “TEST” and then “IO/144 Board” to enter screen.
- Toggle the pointer to the desired input or output using the “Side” and “Top” information from the next section.
- The name of the output or input will be displayed when the cursor is positioned on its Side and Top Location block.
- Inputs will change state when sensors are blocked or encoders are rotated.
- Use the “Toggle” button to toggle the outputs on and off. (Interlocks must be closed)



D.5b Locating I/O LED’s and Card Components

Use the IO/96 reference chart in the next section for the screen and card LED locations. Use the information in the “LED” column to locate the correct rack, card, and LED on the card. For further troubleshooting reference the card configuration number located on the front of each card and on the card itself. Use this configuration number to locate a representation of the specific card in the parts section. Each of these parts drawings includes a number for the schematic that supports that card.

Note:
Some of what you see on the screen is for future use. At this time the first three rows on the left hand half of the screen are used for I/O testing. The bottom three rows are set aside for the future. The same holds true for the right half of the screen. None of this half is currently being used.

D.5c I/O Reference Charts

Side (Port)	Top (Point)	Type	Input/Output Description
0	00	Input	Feed Sensor
0	01	Input	Accumulator Stack Sensor
0	02	Input	Feeder Tach
0	03	Input	Folder Tach
0	04	Input	Demand Signal
0	05	Input	Inserter Deg. Encoder
0	06	Input	Not Used
0	07	Input	Not Used
0	08	Input	Start/Stop Switch
0	09	Input	Cycle Switch
0	10	Input	Dump Switch
0	11	Input	Interlock Sense
0	12	Input	Exit Conveyor Pkg Presence Sensr
0	13	Input	Exit Conveyor Dischrg Sensor
0	14	Input	Enc Home Signal
0	15	Input	Not Used
0	16	Input	Double Detect Sensor
0	17	Input	Folder Exit Sensor
0	18	Input	Accum Presence Sensor
0	19	Input	Cutter Ready
0	20	Output	Dump Clutch
0	21	Output	Exit Conveyor Clutch
0	22	Output	Exit Conveyor Brake
0	23	Output	Accumulator Brake

Side (Port)	Top (Point)	Type	Input/Output Description
1	00	Output	Feeder Clutch
1	01	Output	Folder Motor Enable
1	02	Output	RR Feed Motor Enable
1	03	Output	Not Used
1	04	Output	Inserter Sol #7
1	05	Output	Inserter Sol #1
1	06	Output	Inserter Sol #8
1	07	Output	Shingle Conv Motor Enable
1	08	Output	Inserter Sol #2
1	09	Output	Inserter Sol #3
1	10	Output	Inserter Sol #4
1	11	Output	Inserter Sol #5
1	12	Output	Inserter Sol #6
1	13	Output	Env Pull or Shuttle
1	14	Output	Ink Mark/Kicker
1	15	Output	Envelope Flap
1	16	Output	Inserter Master Relay
1	17	Output	Station 1 Error indicator
1	18	Output	(Ext Feeder/Cutter) Dmne-Out
1	19	Output	Postal Divert
1	20	Input	(Ext Feeder/Cutter) Demand-In
1	21	Input	Inserter Run Signal
1	22	Input	Cutter Sensor
1	23	Input	Station #1 Sensor

Side (Port)	Top (Point)	Type	Input/Output Description
2	00		IF42/RA Conv Input Sensor
2	01		Not Used
2	02		Not Used
2	03		Not Used
2	04		Not Used
2	05		Not Used
2	06		Not Used
2	07		Not Used
2	08		RR IF42/RA Conv Motor Enable
2	09		Not Used
2	10		Not Used
2	11		Not Used
2	12		Not Used
2	13	Output	Feeder Brake
2	14	Output	First Page Hold Brake
2	15	Output	First Page Hold Clutch
2	16	Input	Ink Mrk/RA Conv Pres Sensor
2	17	Output	RR Creeper Motor Enable
2	18		Not Used
2	19		Not Used
2	20		Not Used
2	21		Not Used
2	22		Not Used
2	23		Not Used

D.6 ERROR CODES

ERROR	A unique error number. The first two digits specify a machine area or module. The last three define the specific error.
EVENT	The event or process being monitored.
EVENT CHECK	The mechanism or 'thing' used to monitor the event.
ERROR ON	The reason an error is flagged.
CHECK VALUE	The value being used to flag the error. Some are calculated based on speed, sheet length, etc.
ADJUST VALUE	Where the check value can be adjusted.

ERROR CODE SECTIONS

- 11xxx // System Messages
- 12xxx // Feeder Messages
- 13xxx // Accumulator Messages
- 14xxx // Folder Messages
- 15xxx // Xfer Conveyor Messages
- 16xxx // Barreader Messages
- 17xxx // Inserter Messages
- 18xxx // Linereader Messages
- 19xxx // EngValue Messages
- 20xxx // COMMPORT3 Messages
- 21xxx // InFeed Messages

An "8" in the third digit position is the same as a "0".
Example - "18**8**36" is the same as "18**0**36".

D.6a (11xxx) System Errors

Error Description

11820 "Exit Demand Timeout" (Purpose: Waiting for a Demand from the inserter.)
EVENT: Accumulated Package Ready to Exit Demand.
EVENT CHECK: ExitDemandTimer.
CHECK VALUE: 60 sec.
ADJUST VALUE: Engineering Value 21
Cause: The Time window for Event to occur (60 sec.) had elapsed setting the error.

11821 "Cover Interlock Open or Emergency Stop Set" (See Table at end of section for locations of interlocks)
EVENT: Interlock ON.
EVENT CHECK: Interlock.
CHECK VALUE: --
ADJUST VALUE: --
ANALYSIS: Interlock ON at power ON.

11822 "Cover Interlock Open or Emergency Stop Set"
EVENT: Interlock ON.
EVENT CHECK: Interlock.
CHECK VALUE: --
ADJUST VALUE: --
ANALYSIS: Interlock ON at machine powered.

11824 "Exit Sensor Error" (Purpose:
EVENT: Exit Demand.
EVENT CHECK: Exit Demand and Exit Sensor on exit conveyor, Inserter Station 1 Sense.
CHECK VALUE: --
ADJUST VALUE: --
ANALYSIS: Inserter Station 1 Sensor covered for 6 demands. Sensor blocked

D.6b (12xxx) Feeder

Error Description

12001 "No Feed Error" (Purpose: make sure a page is fed when the clutch is energized.)
EVENT: Feed Clutch ON, page lead edge to Feed Sensor
EVENT CHECK: NoFeedTimer.
CHECK VALUE: 500 msec.
ADJUST VALUE: --
Cause: A page did not feed within the ½ second time window after the clutch was engaged.

12820 "DOUBLE PAGE FED" (Purpose: to stop the feeder when two pages are fed simultaneously.)
EVENT: Under Feed Sensor, Double Detect Sensor.
EVENT CHECK: DoubleDetectCount.
CHECK VALUE: > 2
ADJUST VALUE: --
Cause: During a single feed cycle the computer will check the Double Detect Sensor several times. If the sensor reports two pages during more than one of the computer checks the computer will shut down the feeder and post this error.

12821 "MISSED PAGE" (Purpose: to let the operator know when overlapping pages may have been fed.)
EVENT: Page lead edge to Feed Sensor, next page lead edge to Feed Sensor.
EVENT CHECK: Page lead edge to Feed Sensor.
CHECK VALUE: --
ADJUST VALUE: --
ANALYSIS:
- No page trail edge. Trail edge of previous page not sensed.
- This error can be caused by electronic noise generated by the 438 or a connected machine

INITIAL ACTION:
- Ground the 438 and the connected machine (i.e. inserter) together
- Plug the Open Feed Sensor into the Transfer Conveyor Exit Sensor Plug (if using this option)
- If 438 is not in a read mode, go to Setup>> Feeder>>Pulse Feed and make sure "None" is not selected.

12822 "LONG PAGE FED" (Purpose: page being fed stays under the feed sensor too long or the Page Length setup is incorrect.)
EVENT: Feed Clutch ON, page lead edge and trail edge through Feed Sensor.
EVENT CHECK: JamTimer
CHECK VALUE: 150 msec. [(Sheet Length * 150) / Speed]
ADJUST VALUE: --
Cause: Time exceeded.

12823 "EXTRA PAGE WAS FED" (Purpose:
EVENT: Page lead edge at Feed Sensor.
EVENT CHECK: Feed Sensor.
CHECK VALUE: --
ADJUST VALUE: --
Cause: Page lead edge at Feed Sensor. Feed not processing.

12825 "FEED TO ACCUMULATOR JAM (TIME)" (Purpose:
EVENT: Feed Clutch ON, page lead edge and lead edge through Accum. Sensor.
EVENT CHECK: FeedToAccumTimer.
CHECK VALUE: 170 msec. [(CHECK VALUE * 160) / Speed]
ADJUST VALUE: Enginerring Value 24
Cause: Time exceeded.

12826 "SPEED LOW" (Purpose:
EVENT: Feed Encoder Sensor.
EVENT CHECK: Calculate and Average speed.
CHECK VALUE: 25 inches per second
ADJUST VALUE: --
ANALYSIS: Speed less than value.

12827 "FEED SENSOR COVERED" (Purpose:
EVENT: Feed Sensor ON.
EVENT CHECK: Check at Feeder Power On.
CHECK VALUE: --
ADJUST VALUE: --
ANALYSIS: Feed Sensor ON.

D.6c (13xxx) Accumulator

Error Description

13000 "Stack Error" (Purpose:
EVENT: Page passing through Acc. Stack Sensor.
EVENT CHECK: StackTimer.
CHECK VALUE: 500 msec.
ADJUST VALUE: --
ANALYSIS: Time exceeded.

13001 "Misfeed Error" (Purpose:
EVENT: Acc. Clutch ON, page passing out of Acc. Presence Sensor.
EVENT CHECK: NoDumpTimer.
CHECK VALUE: 150 msec. [(Sheet Length * 150) / Speed]
ADJUST VALUE: --
ANALYSIS: Time exceeded.

D.6d (14xxx) Folder

Error Description

14001 "Jam In Folder" (Purpose:
EVENT: Accum. Clutch ON to lead edge Folder Exit Sensor.
EVENT CHECK: FolderExitTimer.
CHECK VALUE: 400 msec.
ADJUST VALUE: Engineering Value 4
ANALYSIS: Time exceeded.

14002 "Jam At Folder Exit" (Purpose:
EVENT: Accum. Clutch ON, increment. Lead edge at Folder Exit Sensor, decrement.
EVENT CHECK: PackageCounter.
ERROR ON: > 2.
CHECK VALUE: 2.
ADJUST VALUE: Engineering Value 4

14820 "SPEED LOW" (Purpose:
EVENT: Folder Encoder Sensor.
EVENT CHECK: Calculate and Average speed.
CHECK VALUE: 25 inches per second
ADJUST VALUE: --

ANALYSIS: Speed less than value.

D.6e (15xxx) Xfer Conveyor(Xfer Cvyr, Xcvy)

Error Description

15001 "Jam Error"
EVENT: Pack at Xcvy Sta. 1/In Sensor, increment. Pack at Xcvy Out Sensor, decrement.
EVENT CHECK: PackageCounter.
ERROR ON: > 5.
CHECK VALUE: 5.
ADJUST VALUE: Engineering Value 18

15002 "Jam At In Sensor Error"
EVENT: INSERTER. Xcvy. Clutch ON to Pack out of Xcvy Sta. 1/In Sensor.
EVENT CHECK: JamAtInTimer.
CHECK VALUE: 500 msec.
ADJUST VALUE: Engineering Value 23
ANALYSIS: Time exceeded.

15003 "Jam At Out Sensor Error"
EVENT: INSERTER. Xcvy. Clutch ON to Pack into Xcvy Out Sensor.
EVENT CHECK: JamAtOutTimer.
CHECK VALUE: 3000 msec.
ADJUST VALUE: Engineering Value 22
ANALYSIS: Time exceeded.

15002 "Jam At In Sensor Error"
EVENT: HOPPERFILL. Xcvy. Clutch ON to Pack into Xcvy Sta. 1/In Sensor.
EVENT CHECK: JamAtInTimer.
CHECK VALUE: 500 msec.
ADJUST VALUE: Engineering Value 23
ANALYSIS: Time exceeded.

15003 "Jam At Out Sensor Error"
EVENT: HOPPERFILL. Pack into Xcvy Sta. 1/In Sensor to Pack into Xcvy Out Sensor.
EVENT CHECK: JamAtOutTimer.
CHECK VALUE: 3000 msec.
ADJUST VALUE: Engineering Value 22
ANALYSIS: Time exceeded.

15004 "?????"
~~EVENT: HOPPERFILL. Pack into Xcvy Sta. 1/In Sensor to Pack into Xcvy Out Sensor.~~
~~EVENT CHECK: JamAtOutTimer.~~
~~CHECK VALUE: 3000 msec.~~
~~ADJUST VALUE: Engin. Value 22~~
~~**ANALYSIS:** Time exceeded.~~

15005 "Un-expected Pack Exited Xfer Conveyor" (Purpose:
EVENT: Inserter On-Line, Off-Line, Pack into Xcvy Sta. 1/In Sensor to Pack into Xcvy Out Sensor.
EVENT CHECK: Demand Feed
CHECK VALUE: 100 msec.
ADJUST VALUE: Engineering Value 07
ANALYSIS: Time exceeded.

15006 "Expected Pack Did Not Exit Xfer Cvyr" (Purpose:
EVENT: Inserter On-Line, Off-Line, Pack into Xcvy Sta. 1/In Sensor to Pack into Xcvy Out Sensor.
EVENT CHECK: Demand Feed
CHECK VALUE: 100 msec.
ADJUST VALUE: Engineering Value 07
ANALYSIS: Time exceeded.

15820 "Jam Into Xfer Cnvy Station 1" (Purpose:
EVENT: HOPPERFILL. Xcvy. Clutch ON to Pack into Xcvy Sta. 1/In Sensor.
EVENT CHECK: IntoStation1Timer.
CHECK VALUE: 225 msec. [(CHECK VALUE * 100) / Speed]
ADJUST VALUE: Engineering Value 8
ANALYSIS: Time exceeded.

15821 "Jam Out Of Xfer Cnvy Station 1" (Purpose:
EVENT: HOPPERFILL. Xcvy. Clutch ON to Pack out of Xcvy Sta. 1/In Sensor.
EVENT CHECK: OutOfStation1Timer.
CHECK VALUE: 60 msec. [(CHECK VALUE * 100) / Speed]
ADJUST VALUE: Engineering Value 9
ANALYSIS: Time exceeded.

D.6f (16xxx or 18xxx) Reader

(nn=16 Bar Read Messages or nn=18 Line Read Messages)

Error	Description	Cause/Remedy
nn001	**"GROUP NUMBER OUT OF SEQUENCE"**	The page that was just fed did not follow the selected group sequencing pattern. -If the group is not out of sequence, check to see that the proper barcode is printed on the page and that the barcode matches the specifications. -Check to see that the proper barcode job is selected.
nn002	**"EXPECTED END OF GROUP"**	If page sequencing down and the last page fed was page 1, the software expects the next page to have an end of set mark on it (new set and highest page of that set) or if 6 pages are fed into the accumulator, the software expects the next page to have a subset mark or an end of group mark on it. -If an end of group mark was present, check to see that the proper barcode is printed on the page and that the barcode matches the specifications. -Check to see that the proper barcode job is selected.

nn003 "BLANK PAGE"	No code detected. -Check read setup again, particularly focus. -Check for correct feed speed. -Check speed sensor for proper operation. -Check for failure on the CPU, replace as necessary. -Bad UARTs. -Bad software.
nn004 "SHORT GROUP"	-Check the page to determine if error is valid -Check read setup again, particularly focus. -Check for correct feed speed. -Check speed sensor for proper operation. -Check for failure on the CPU, replace as necessary. -Bad UARTs. -Bad software.
nn005 "DUPLICATE PAGE"	-Check read setup again, particularly focus. -Check for correct feed speed. -Check speed sensor for proper operation. -Check for failure on the CPU, replace as necessary. -Bad UARTs. -Bad software.
nn006 "PAGE OUT OF SEQUENCE"	The page that was just fed did not follow the selected page sequencing pattern. -If the page is not out of sequence, check to see that the proper barcode is printed on the page and that the barcode matches the specifications. -Check to see that the proper barcode job is selected.
nn007 "INVALID GROUP"	Group is not part of set. -Check to see that the proper barcode is printed on the page and that the barcode matches the specifications. -Check to see that the proper barcode job is selected. -Check read setup again, particularly focus. -Check for correct feed speed. -Check speed sensor for proper operation.

-Check for failure on the CPU, replace as necessary.
-Bad UARTs.
-Bad software.

nn008 "EXPECTED PAGE ONE"	If page sequencing up, the software expects the first page of each set to be either a 0 or 1 (depending on what minimum page number was selected in the page setup). -If the page was page 1, check to see that the proper barcode is printed on the page and that the barcode matches the specifications. -Check to see that the proper barcode job is selected.
nn009 "GROUP NUMBER OUT OF RANGE"	Group code was not in specified range (i.e. 0-7)
nn010 "PAGE OUT OF RANGE"	Similar to Group Out of Range error (page range must be within 1-7)
nn011 "INVALID!"	Invalid command -Cycle machine power
nn012 "NOT ENOUGH NV-RAM"	The program has run out of non-volatile ram. -You should never get this error. If you do get this error, either the software is bad or the CPU board is bad.
nn013 "PRESETS CORRUPT"	Some of the preset parameters have fallen out of their defined maximum or minimum range. -If new EPROMS were just installed this error might occur. If this is the case, ignore the error. -If the battery jumper was pulled from the CPU board this error might occur. If this is the case, install the battery jumper and ignore the error.-If neither of the previous scenarios happened, the CPU board is probably bad.
nn014 "NV RAM FAILED"	Data in the non-volatile ram was changed. -Power to the CPU was unplugged directly at the board. -Noise in the 120 VAC power.
nn015 "DUAL PORT RAM FAILED"	Hardware failure on reader board -Battery failed or battery jumper missing -Bad CPU-186 board
nn016 "INVALID COMMAND"	Hardware failure on reader board -Battery failed or battery jumper missing -Bad CPU-186 board
nn017 "INVALID PIC INT."	Hardware failure on reader board -Battery failed or battery jumper missing

-PC 104 CPU Board

nn018	**"INVALID SETUP DATA"**	Reader board memory corrupted -Restart machine
nn019	**"PARITY ERROR"**	Actual lines of codes must match parity setting (odd or even). -Bad code
nn020	**"computed in action" REGISTRATION BAD**	OMR Linecode marks are out of tolerance or the spacing is inconsistent -Bad code
nn021	**"BAD ON-CHIP 8501 RAM"**	Hardware failure on reader board -Battery failed or battery jumper missing -Bad CPU-186 board
nn022	**"INVALID READER ERROR"**	CPU does not understand reader
nn023	**"INVALID CAL. SETUP"**	Feed through calibration sheet several times to ensure that encoder is reading properly (consistent read numbers) -Reader encoder bad
nn024	**"NO BANK 2 GATE MARK"**	Reader was expecting two sets of read code, one was missing -Reader set up improperly -Code is physically missing -Check to see that the proper barcode job is selected.
nn025	**"computed in action "CALIB_OUT_OF_RANGE"**	Calibration failed -Check calibration sheet -Check read setup again, particularly focus. -Check for correct feed speed. -Check speed sensor for proper operation.
nn026	**"YES NO EOG ARE SAME"**	This error is only associated with European machines -Check read setup again, particularly focus. -Check for correct feed speed. -Check speed sensor for proper operation. -Check for failure on the CPU, replace as necessary. -Bad UARTs. -Bad software.

nn027 "ROLL PAGE OUT OF SEQUENCE"	The page that was just fed did not follow the selected roll sequencing pattern. -If the roll is not out of sequence, check to see that the proper barcode is printed on the page and that the barcode matches the specifications. -Check to see that the proper barcode job is selected.
nn028 "UNEXPECTED RESPONSE"	-Paper jam -Reader board failed -Reader encoder bad
nn029 "EXPECTED READING"	-Blank page -Read encoder failed -Paper jam -Feed sensor out of adjustment
nn030 "READER REBOOTED"	-Reader encoder failed -Bad read board
nn031 "computed in action" "CALIB. IN RANGE"	Calibration was successful
nn032 "NO RANDOM CHECK MK."	-Incorrect document in accumulator -Random check mark not set correctly in Setup -Code bad or misprinted
nn033 "UNEXPECTED RANDOM CHECK"	-Incorrect document in accumulator -Random check mark not set correctly in Setup -Code bad or misprinted
nn034 "PACK LARGER THAN SET"	There were more sheets in the package than expected.
nn035 "PACK LESS THAN SET"	There were less sheets in the package than expected.
nn036 "GROUP NUMBER CHANGED IN SET"	Every page within a set is supposed to have the same group number and the page that was just fed did not. -If the group did not change within the set, check to see that the proper barcode is printed on the page and that the barcode matches the specifications -Check to see that the proper barcode job is selected.
nn037 "LAST SET SAME GROUP NUMBER"	The previous group had the same group # as the current.
nn038 "MAX SHEETS IN ACCUM."	The maximum number of sheets set in the system has been reached -Change setting if a larger pack size is desired

-The package size has exceeded the machines capabilities

nn039 "UNEXPECTED EOG"	The end of group mark was read but not expected. -The document sequence is out of order. -Misread. -Bar code misprinted.
nn040 "NO RESPONSE TIMEOUT"	The reader did not return a reading in the proper amount of time. -Make sure that the barcode reader is lined up with the code. -Make sure that the barcode print on the paper is good quality.
nn041 "BAD READ" (bar read)	The bar code reader returned an error. -Make sure that the barcode reader is lined up with the code. -Make sure that the barcode print on the paper is good quality.
nn042 "MAX PAGE NOT = NO. PAGES" (bar read)	Incorrect page count in accumulator -Page count setting incorrect -EOG mark not seen -Read error
nn043 "INVALID GROUP NUMBER" (bar read)	-Incorrectly printed document -Documents out of order -Code not seen -Check, clean and adjust scanner
nn044 "BAD CHECK DIGIT" (bar read)	Check digit in code is wrong -Code not seen -Check, clean and adjust scanner
nn045 "EXPECTED END OF SET" (bar read)	Documents in package exceeded the max sheets expected
nn046 "EXPECTED PAGE ZERO" (bar read)	Page out of sequence -Incorrectly printed document -Documents out of order -Code not seen -Check, clean and adjust scanner

D.6g (17xxx) Inserter Error Messages

Error Description

Currently no error messages for this module.

D.6h (19xxx) EngValue Error Messages

Error Description

Currently no error messages for this module.

D.6i (20xxx) EXITCOMM Error Messages

Error Description

20001 "No Message Response"

A message was sent to an exit device (i.e. Inserter), the exit device did not respond.

D.6j (21xxx) InFeed Error Messages

Error Description

21801 "Paper Demand Timeout"

EVENT: Paper Demand Switch ON to Paper Demand Switch OFF.
EVENT CHECK: PaperDemandTimer.
CHECK VALUE: 20000 msec.
ADJUST VALUE: Engin. Value 17
ANALYSIS: Time exceeded.

21001 "Paper Demand Timeout"

A demand for paper was sent to infeed device (i.e. Feeder), paper was not detected by the feed sensor within the time frame set in engineering values

D.7 ANALYSIS

D.7a Troubleshooting the GBR Line Code Reader

- The pullout rollers (the rollers that are right after the singulator) should be adjusted such that they evenly grip the paper as it moves through. Rip off two strips of paper and place the paper on each side of the pullout rollers. Turn the rollers by hand and make sure that the two pieces of paper feed through evenly. If the paper does not feed through evenly, use the adjustments on the sides of the roller shaft to adjust the rollers.

D.7b Physical Specifications of the Line Code System

The Print Contrast Ratio should be at least 65%

Mark size specifications: Minimum length of solid mark 0.3” (recommend .5”)

Minimum width of solid mark 0.015” (recommend .020”)

Maximum width of solid mark 0.030”

Clear area specifications: 0.064" when using 1/8" line spacing and 0.094" when using 1/6" line spacing (minimum clear area between marks taking into account print registration and maximum function line size)

Clear area required on each side of marks 0.2”

Clear area required at the lead edge of the Gate mark 0.332”

Clear area required at the trail edge of the code 0.166”

Code location on paper

Measured from the leading edge of the form the code should be placed on the first 1/3 of the form. The Gate mark registration must be held to +/- 1 print line. (0.125" with 1/8" line spacing) (0.166" with 1/6" line spacing).

The minimum distance of the Gate Mark from the leading edge is 0.25”.

All other marks should be placed, with respect to the Gate mark, within a 1/4 of a print line of their expected placement.

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E.1 FEEDER

E.1a Description

A paper hopper (Creeper Conveyor) supplies the bottom fed friction feeder continuously while the operator loads paper from the top. It has 4 mounts (2 each side, with set screws) in which the hopper slides. The creeper conveyor is comprised of two black rubber belts driven by a motor located on the bottom side of the hopper. Controlled by a paper level detector, the motor is activated when the Paper Demand Wand activates the paper demand switch.

The two stainless steel paper guide rails, mounted on the hopper, are adjustable via a locking handle at the rear. At the front they interlock with the Feeder rails, then lock to shafts running across the machine. Both sets of rails should be adjusted and aligned together.

A one inch wide timing belt (main feed belt) drives the bottom sheet of paper under the singulator roller. Two urethane belts are located to either side of the main feed belt, and assist the main feed belt, smoothing variations in frictional drive.

A paper demand wand and switch mechanism senses the level of the paper going into the feeder area. It's job is to regulate the amount of paper in the feeder area providing the most productive feeding. A two-inch stationary roller (singulator roller) rests above the feed belt in the center of the feeder and allows only the bottom sheet of paper to be fed while holding back all others.

A series of sensors monitors the flow of paper through the 438 Feeder System. These are known as retro-reflective sensors, and require no adjustment. Each sensor is aimed at a reflective tape placed on the other side of a gap through which the paper travels. The sensor looks constantly at its reflection from the tape and reports when the reflection disappears (paper presence). The feed sensor monitors correct feeding and non-feed of paper while other similar sensors located in the accumulator section detect stacking and releasing of paper.

Read sensing is accomplished by a Line Code Reader on either or both the left or right sides of the feeder. By using a reflective beam to search for code marks a variable electronic signal is produced and sent to a proprietary electronic read board interpreting the variations in light intensity.

The double feed detect sensor is an ultrasonic device that will detect multiple sheets fed from the feeder.

Paper feeding is accomplished when the feed motor drives the belts. An electric clutch engages the feed belt at a signal from the controller.

The optical encoder (blue-clad, located on the right side of the upper pullout shaft) monitors feeder run speed.

E.1B TIMING PROCEDURES

(Not applicable: timing is a function of software and CPU.)

E.1C FEEDER SETUP AND ADJUSTMENTS

Paper Guide Rails

These rails guide the paper from the hopper table, through the singulator area and to the accumulator area without skewing.

The guide rails should be set so that with a single sheet of paper laying flat between them has a 1/16-inch space between the right and left edges of the sheet and the guide rails. Please Make certain that the guide rails run parallel with the side frame of the machine. Loosen the setscrews and the hanger bracket thumbscrews locking the rail blocks to the cross shafts to adjust these rails.

NOTE: Be sure the side rails are feeding the paper parallel to the singulating roller.

Creeper Conveyor Adjustment

The position of the creeper conveyor relative to the feeder is an important adjustment. To adjust:

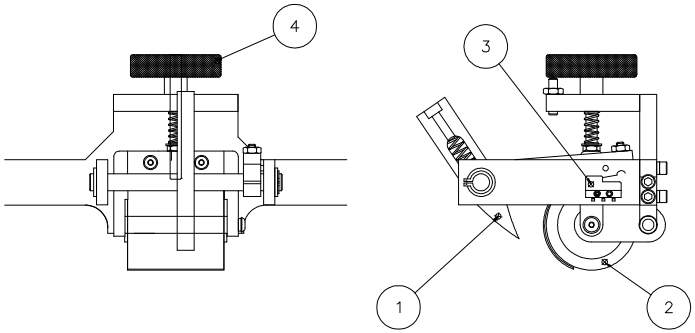
a) Place a sheet of paper in the feed area, up to but not under the singulator.
b) Loosen the four set screws of the creeper guide rails. Once this is accomplished the conveyor will move freely in and out. Do not pull it all the way out of the clamps: it will fall!
c) Bring the hopper table 1/2" away from the back edge of the sheet of paper.
d) Tighten the four set screws to clamp the table in this position.

Whenever document length is changed, this process must be performed to ensure the proper transfer of paper from the hopper table to the feeder area.

Paper Level Detector

The demand switch (3) monitors the paper through a metal wand (1). On the top of the wand is a spring-loaded, hex head adjustment bolt which, when turned, raises and lowers the wand.

- Raise the wand to allow more paper to be fed into the feeder.
- Lower the wand to reduce the amount of paper



Item	Description	Part #
4	Singulator Adjust Knob	600B–16435–009
3	Paper Demand Switch	002B–08212
2	Singulator Roller	177–25913–600
1	Paper Level Detecter	600a–16435–005

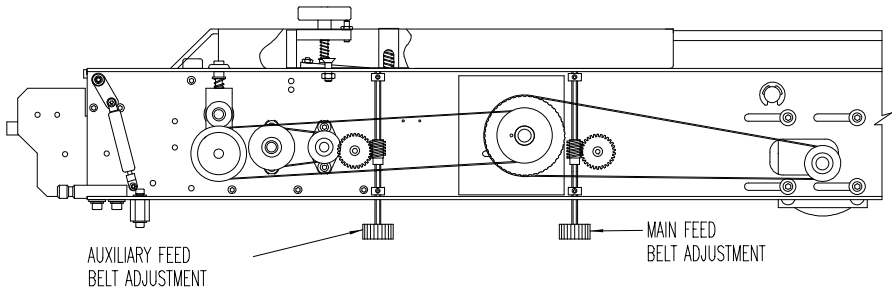
Parts List

Singulator and Paper Demand

Setting Main Feed Belt Tension

The feed belt provides the primary force separating a sheet from the bottom of the shingled stack. The setup procedure for this belt is described below. The feed belt tension adjustment knob is factory set, limited to approximately 3/4 turn. This is adequate operator adjustment for typical paper weight variations. If the Feed Belt is replaced:

1. Loosen the long set screw (3/32") on the top stop collar of the feed belt tension knob shaft.
2. Lay a straight edge across the top of the feed belt (lengthwise). Make sure it lays across both pulleys.
3. Adjust the feed belt tension knob so 3/16 inch feed belt deflection is possible in the middle of the belt.
4. Now turn the tension knob 3/8 turn CCW.
5. Slide the stop collar to the top of the tension knob shaft. Position collar so the long set screw is perpendicular to the side frame. Tighten set screw to the tension knob shaft. This will again limit adjustment to 3/4 turn.



Belt Adjustment Figure

Singulating Roller

The singulating roller creates a precise singulating gap. There are three critical adjustments required to get a precise singulating gap. These adjustments are:

- Vertical position of singulating roller
- Singulating roller parallel with lower rollers
- Occasional rotation of singulating roller

Position of Singulating Roller

The position of the Singulating Roller with respect to the two rollers on the lower shaft is critical. This spacing creates the singulating gateway. The setup process is as follows:

1. Place one sheet of paper under the singulator.
2. Lower the singulating roller so the sheet can not pass under the roller. (Use chrome knurled knob.)
3. Slowly raise the singulating roller by rotating the chrome knob clockwise
4. Attempt to pull the document out while slowly raising the singulating roller.
5. When the document starts to move, as you firmly pull it under the singulating roller, proper singulation adjustment is achieved.
6. Load the feeder area with paper and make a test run.
7 If more than one sheet is fed, lower the singulator two knob clicks. If, after adjusting as many as five knob clicks proper feeding is not obtained, then all of the setup procedures for the singulator should be reviewed.

NOTE: Proper singulator adjustment depends on paper variables such as stock, finish and environmental factors.

Specific adjustment on every job will be different. Adjust the singulator roller as paper is feeding to get best setting.

Set Singulating Roller Parallel to Lower Rollers

The gap between by the singulating roller and the two lower rollers must be equal for both of the rollers. The procedure for testing and making the adjustment is described below.

Note: This adjustment is normally done only when a new singulating roller is installed. It is not necessary to adjust it on a regular basis.

1. Cut two strips of paper from the same document (approximately 1/2" x 8").
2. Put them between the two lower rollers and the large Singulating Roller.
3. Adjust singulating roller until light tension is felt on the paper between the rollers.
4. Check that the tension on both strips of paper is the same. If it is not the same, then adjust the geometry of the singulating roller.
5. Loosen the 10-32 x 5/8” socket head cap screws (4) on the side rail or the back of the singulator plate. Adjust either to best advantage.
6. Carefully position the singulator, using the small amount of play available, to raise the side of the singulator that has the most tension.
7. Tighten the 10-32 x 5/8” socket head cap screws loosened in step 5.
8. Retest the tension of the two strips of paper by returning to step 3.

Rotating Singulating Roller

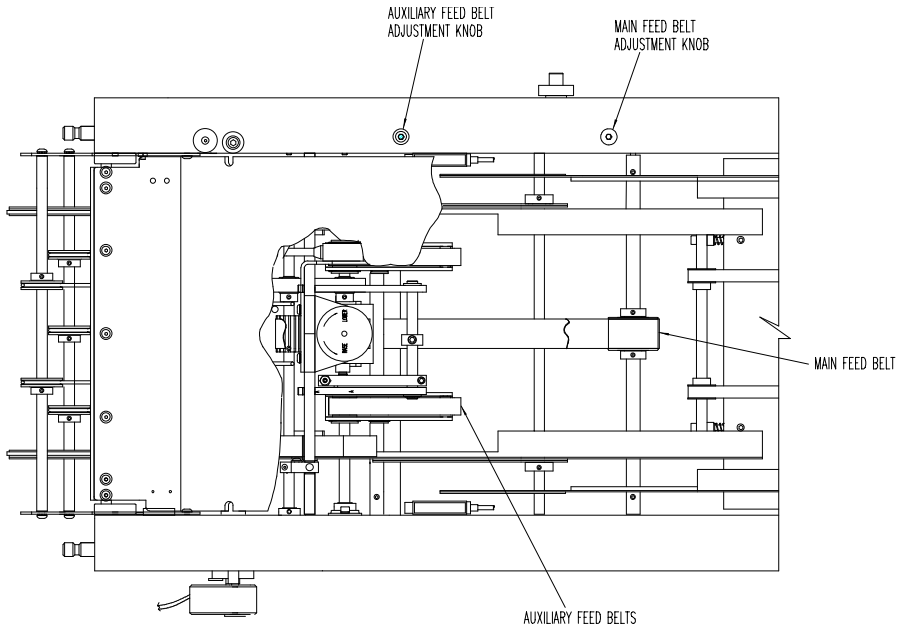
The singulating roller is the place where the highest frictional forces are created. These frictional forces wear down the singulating roller. This requires that the singulating roller be rotated approximately every 250,000 sheets fed, depending on paper type and operator’s adjustment of the singulator.

1. Raise the singulating roller above the feed rollers and feed belt until there is a gap.
2. On the left hand side of the singulating roller use a 5/64" allen wrench to loosen the set screw which keeps the singulating roller from rotating.
3. Rotate the singulating roller to expose a new wear surface (rotate about 1/4 inch). The worn surface should be rotated forward. This will prevent the worn surface from coming in contact with paper that is being fed into the singulation point.

Auxiliary Feed Belt Adjustment

The auxiliary feed belts are adjustable by angling the back end up or down.

- Turn the knob clockwise to lower the rear end of the auxiliary drive belts
- Turn the knob counterclockwise to raise the rear end of the belts.



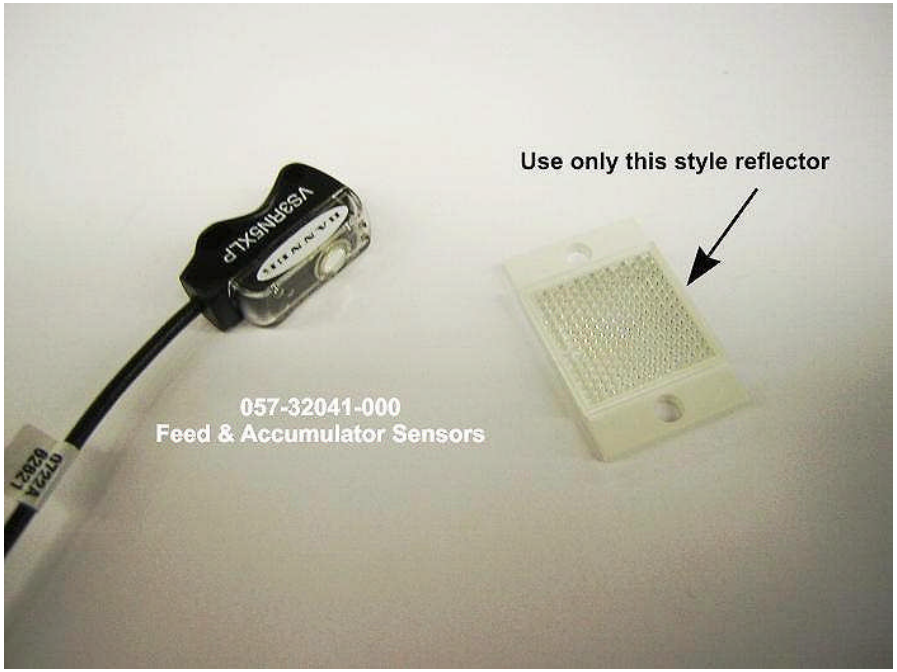
Feed Belts Figure

The ideal setting for the auxiliary belts is when the upstream end is raised just above the main feed belt.

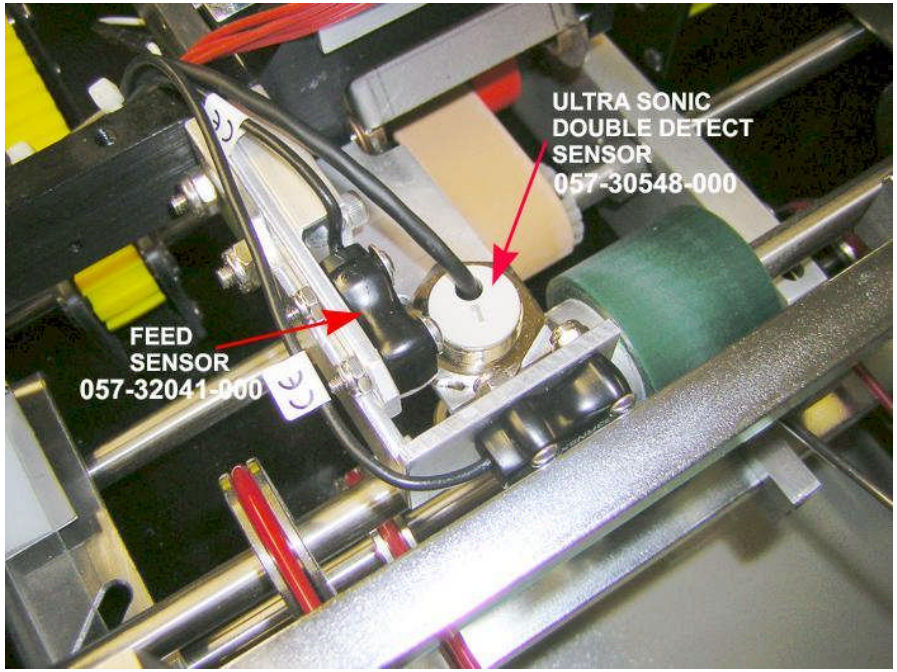
The auxiliary feed belts assist the main feed belt when variations in frictional characteristics are encountered and the feeding of paper becomes erratic. The auxiliary feed belts would be adjusted when the gap between the fed sheets needs to be improved. Raising the auxiliary feed belts will decrease the gap; lowering the belts will increase the gap.

Sensor Adjustments

All of the paper detecting sensors on the 438 are Retro-Reflective digital sensors. Each sensor has its own amplifier unit and requires no adjustment.



The picture below shows both the Double Detect and the Feed Sensor as located in the Feeder section on the GBR Friction Feeder.



E.2 ACCUMULATOR SECTION

E.2a Description

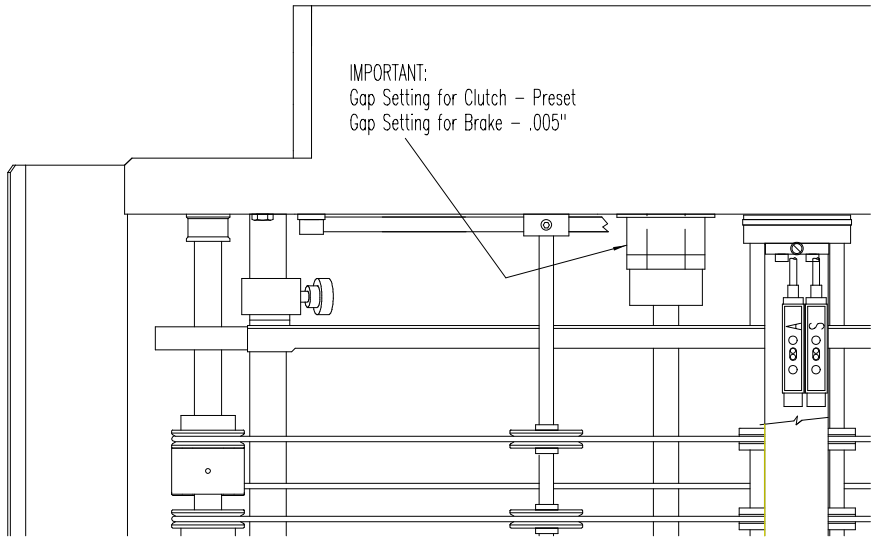
Fed by the feeder section, the accumulator is used to group up to twelve documents before it sends them to the folder. Wedge shaped stacking ramps position pages sequentially. Stacking rollers are used to stop the paper and hold it in position. When released, the stacking rollers drive the collected pages out of the accumulator.

The Dump Clutch activates the stacking rollers, releasing the accumulated pages. A stack sensor (marked with an “S”) detects paper arriving in the accumulator and is positioned just before the downstream **edge** of the ramps. The accumulator sensor (marked with an “A”) indicates presence or absence of a package in the accumulator and is positioned just downstream from the **back edge** of the ramps. It also monitors for successful package discharge when the dump clutch has been activated.

E.2b Accumulator Clutch and Brake Adjustments

The accumulator clutch is designed with a preset gap; no adjustments are possible or necessary. There should be a slight amount of rotational free play in the clutch body to prevent binding.

The accumulator brake does require a gap setting of .005”. This setting is critical, too tight and the drag on the clutch will cause premature wearing of the clutch and the brake. Too wide of a gap and the stacking rollers won’t stop the documents correctly in the accumulator.



ACCUMULATOR CLUTCH & BRAKE SETTING

E.2c Accumulator Dump Roller Replacement

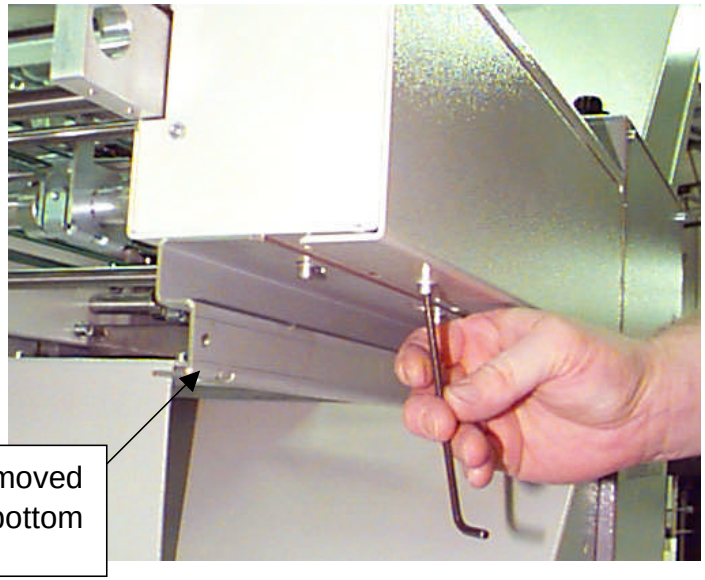
To replace the dump rollers it is first necessary to disconnect the accumulator from the folder:

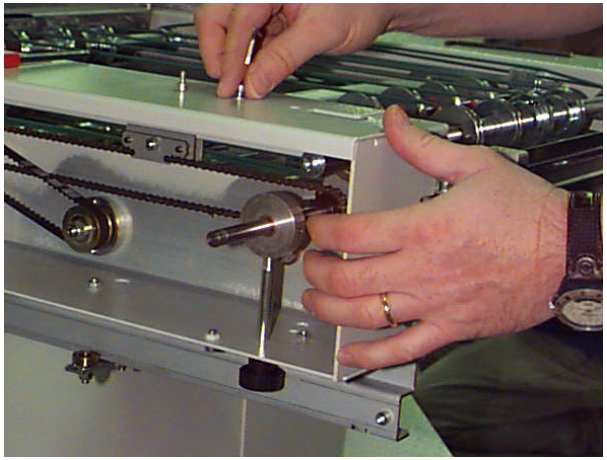
1. Disconnect all electrical connectors to the feeder.
2. Remove the left feeder cover.
3. Loosen the two thumbscrews that latch the feeder to the accumulator.
4. Loosen the accumulator to feeder drive belt tensioner and remove belt.
5. Move feeder out of way.
6. Remove both accumulator side covers.
7. Remove the lower fold plate sliding cover by first removing the two stop screws on the slide track.
8. Remove the green drive belt going from folder to accumulator.
9. Carefully remove all wire ties for left side folder to accumulator terminal block wire bundle.
10. Prepare a table to use for supporting the accumulator whose top is within +/-3” of the bottom of the accumulator.
11. Remove the two nuts that secure the accumulator to the folder.
12. Carefully pivot the accumulator onto the table beside the folder.

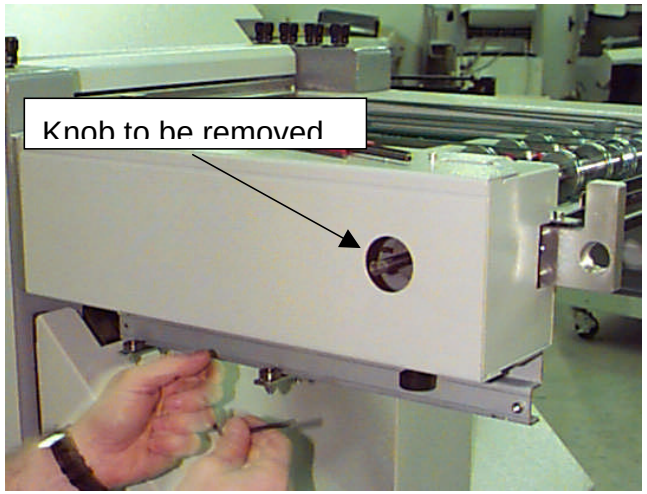
E.2d Accumulator Shaft & Bearing Replacement

Removal of Covers

1. Remove power and the lexan accumulator cover. Separate from feeder section.
2. Remove glide track screws to facilitate removal of bottom cover.
3. Remove accumulator right side cover by removing bottom screws. Place hardware in a safe place.
4. Remove knob, by loosening its socket head cap screw, and left side cover by removing bottom screws. Place hardware in a safe place.
5. Remove end caps on both sides.



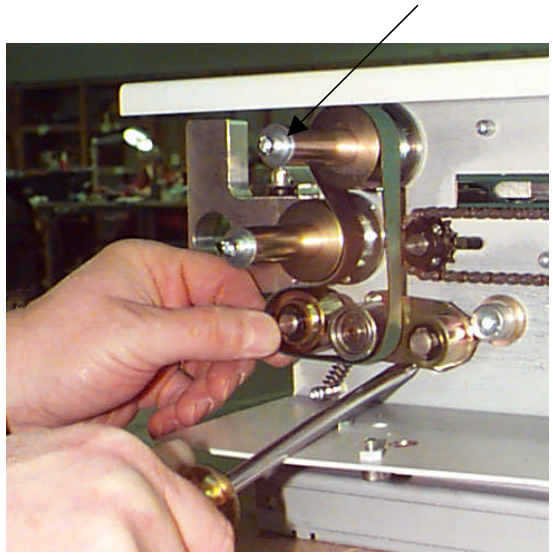




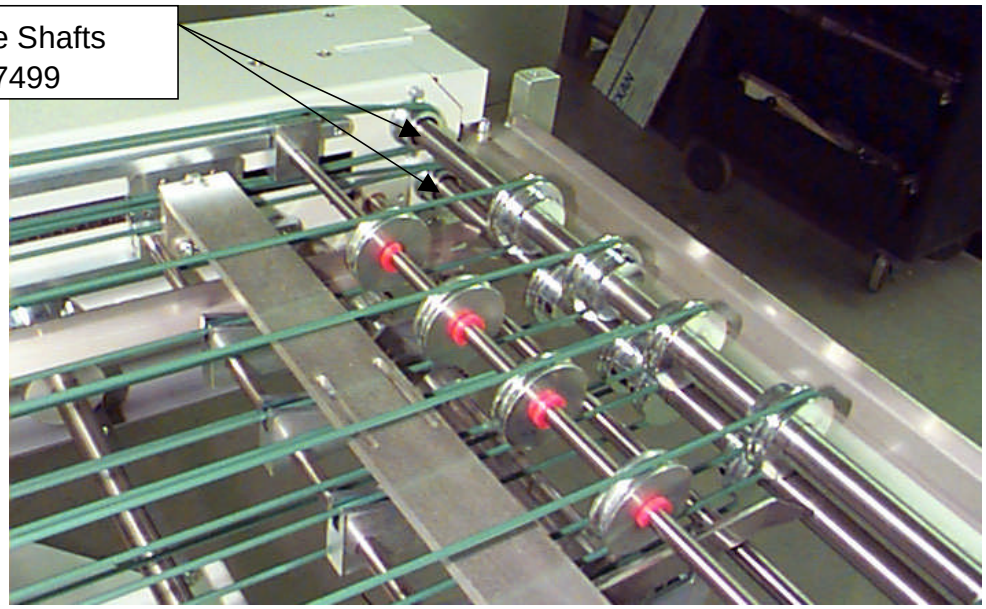
E.2e Infeed Drive Shaft and Bearing Replacement

1. Remove flat green belt by carefully prying up spring tension idler.
2. Remove the screws on each end of the top shaft by using an allen wrench in each end and turning in opposite directions.

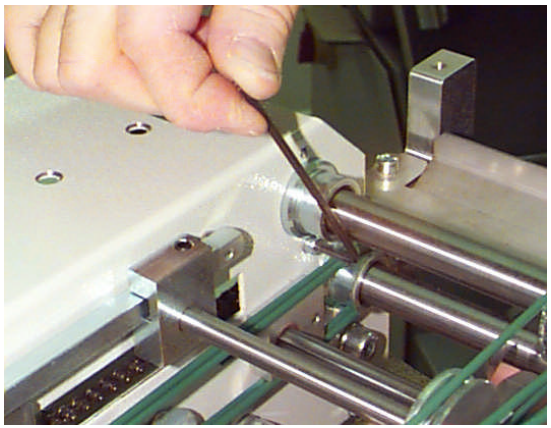
Screws to be removed for removal of shaft



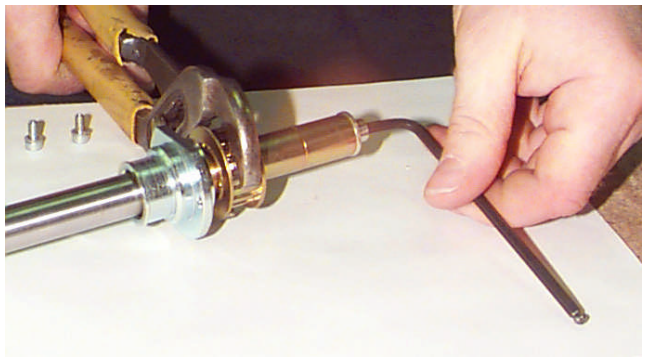
Infeed Drive Shafts
186-032017499

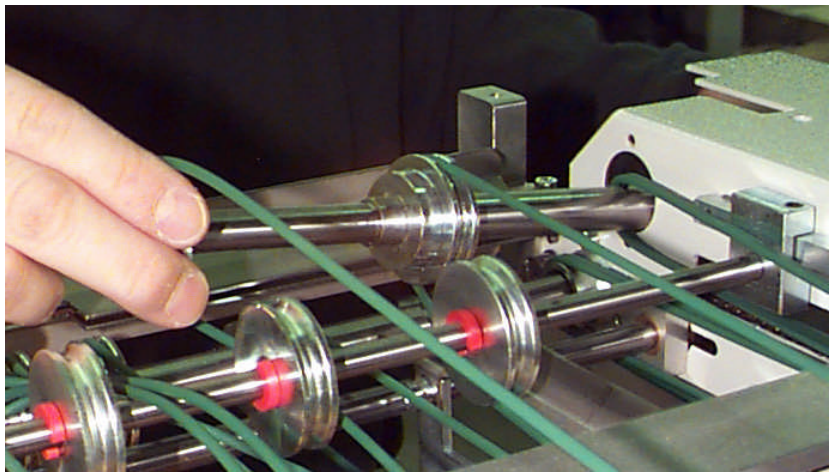


3. Start removing parts: screw, washer, long spacer, flat pulley and key.
4. Loosen screw for bearing from inside. Slide bearing housing off. Push bearing out.

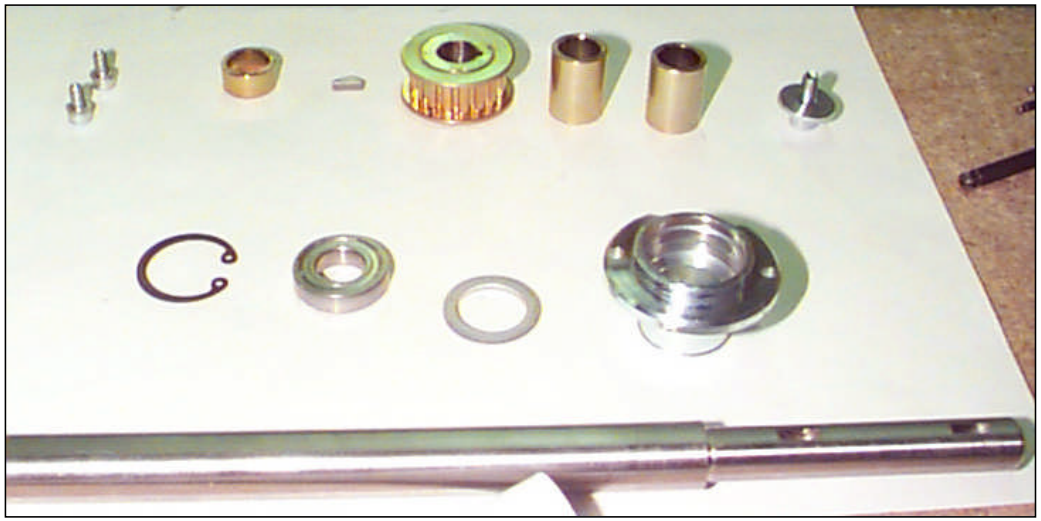


5. Loosen round belt pulleys. Remove screws for bearing on left side.
6. Slide shaft over, removing pulleys one at a time until complete shaft is out.
7. Loosen screw without marring shaft by holding at timing pulley.

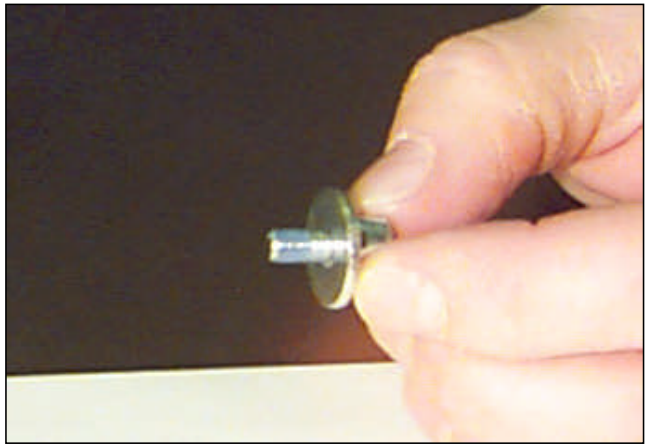




8. Remove parts: screw, washer, 2 spacers, pulley, key, small spacer, bearing housing with clip.
   Note: The turned down end is shorter on left side (2 ¾") than on right (3 3/16") (Important for reinstallation).
9. Remove C-clip from bearing housing. Remove bearing and spacer.
10. Place spacer back in bearing housing. Replace ball bearing with new 186-031112035 inside bearing housing. Reinstall C-clip.
11. Slide complete housing onto new top shaft 186-032017499. Note turned down side. Slide on small spacer (.312"). Install new key 186-031135001, timing pulley, 2 long spacers, washer and screw (will be loctited at a later step).
12. Slide shaft back into place with each round green belt and pulley back into position. Use bottom shaft as a guide.
13. Replace screws for bearing housing on left side (that were removed in step 5).
14. Replace ball bearing in housing that was removed in step 4 with new ball bearing 186-03112035. Slide onto shaft. Note location of flat toward infeed end. Mount bearing housing with the flange to the right side.
15. Tighten down both bearing housings screws.
16. Install new key 186-031135001 into shaft and replace flat belt pulley and long spacer (that were removed in step 3).



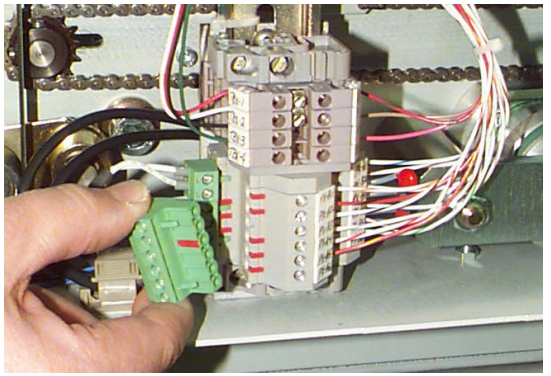
17. Apply blue loctite 188-24205 onto screw threads on both ends of shaft. Tighten both screws at the same time using allen wrench at each end.
18. Use a ruler to position round belt pulleys back into place.
19. Reinstall flat green belt (removed in step 1).
20. Spin the shaft to check.
21. Repeat steps 1 – 20 for bottom shaft.
22. If infeed end was the only area that was a problem, replace all covers and turn on power. If the dump end is a problem, continue with the following procedure.

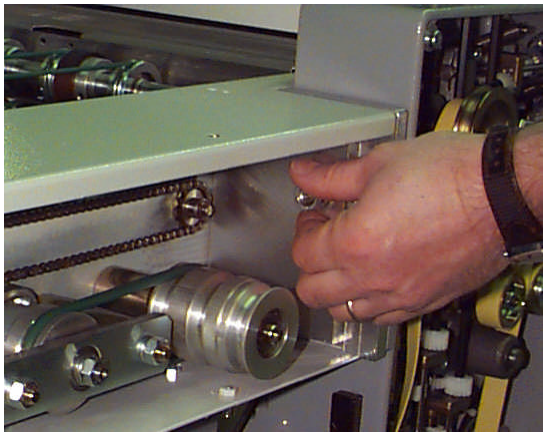


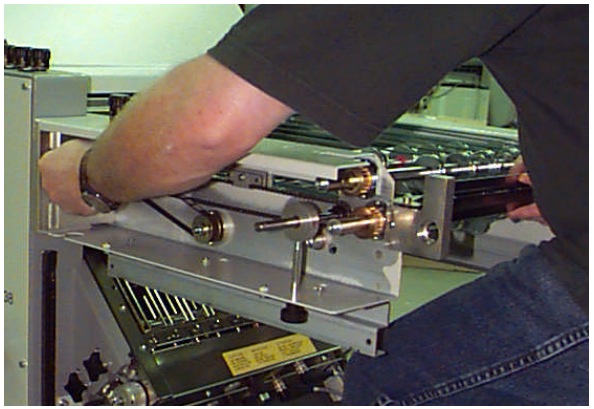
E.2f Dump Shaft and Bearing Replacement

1. Remove right cover on folder to expose inside folder. Place hardware in safe place.
2. Remove round green belt.
3. To create space for Accumulator to be pulled off, unplug green phoenix block and clip ty wraps or if there is a loop of extra cable only unclip along top.

Loosen nut on both sides. Support Accumulator while removing. Set on bench near Folder.



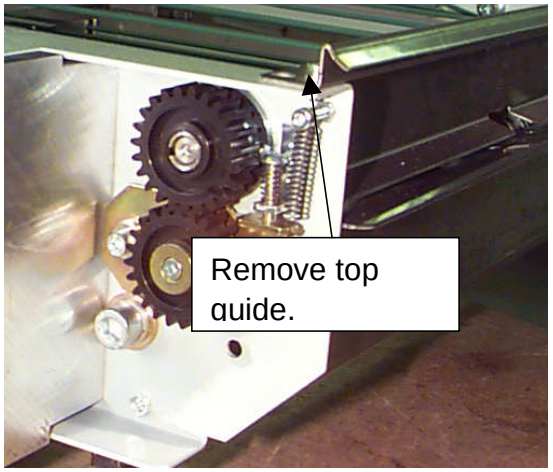


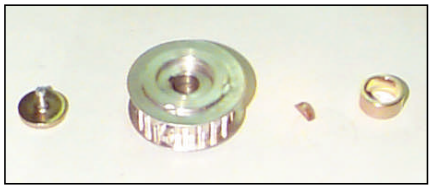


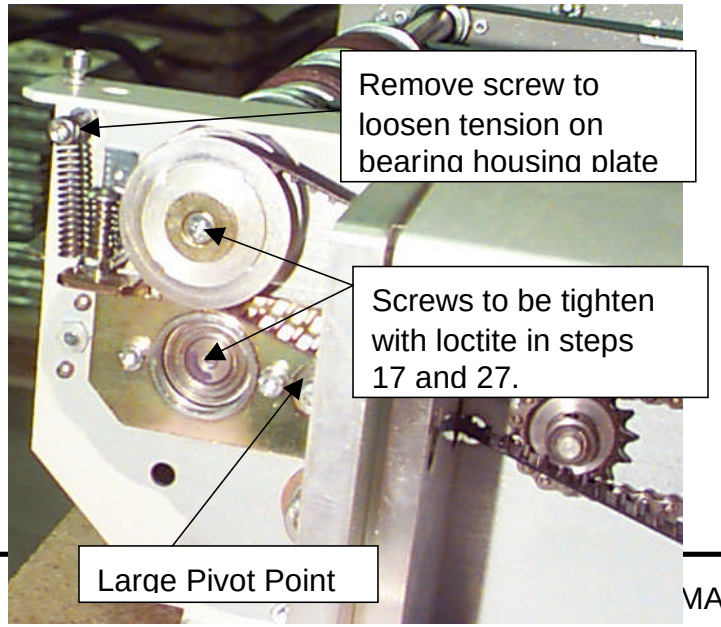
4. Loosen both screws on top dump shaft.
5. Remove top guide.
6. Loosen setscrew in spur gear and remove.
7. Loosen setscrews on round belt pulleys and rollers.

8. Remove timing belt and pulley from top shaft. Note location of recessed side of pulley. Remove key and spacer.

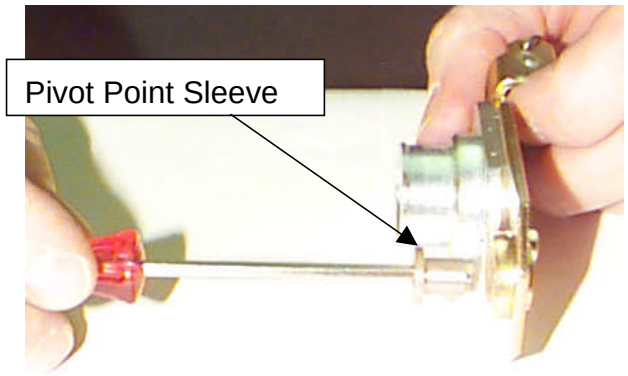
9. Remove screws for both bearing housings from inside.
10. Slide shaft out.
11. Remove spacer (.312”), clip, ball bearing and washer.
12. Reassemble bearing housing with new ball bearing 186-031112035.
13. On new top shaft 186-032017833, slide bearing housing, new key 186-031135001 and spur gear. Tighten setscrew on spur gear (from step 7).






Remove screw to loosen tension on bearing housing plate
Screws to be tighten with loctite in steps 17 and 27.
Large Pivot Point

14. Slide top shaft into place and reinstall green belts, rollers and pulleys using bottom shaft as a guide. Reinstall screws for bearing housings.
15. Replace new key 186-031135001 on left side and reinstall spacer, timing pulley with timing belt. Pulley must line up with key.
16. Apply blue Loctite 188-24205 to top shaft end screws and tighten simultaneously.
17. Remove screws from bottom shaft.
18. Remove spur gear and spacer from bottom shaft on right side. See photo at step 7.
19. Remove spring by removing screw. See photo above.
20. Remove left side plate with bearing housing by removing large screw and washer in right side. Be careful not to lose pivot point sleeve.
21. Remove right side plate with bearing housing by removing large pivot point screw. Be careful not to lose pivot point sleeve.
22. Replace both ball bearings with new ball bearing 186-031112035 in both bearing housings.
23. With both plates and bearing removed, Slide new bottom dump shaft 186-032017834 on by pushing end of old shaft off and moving pulleys and rollers into place.
24. Reinstall plate and bearing housings with pivot point screw and spring screw. Tighten hex nut back against chassis.
25. Replace spur gear and spacer.
26. Apply blue Loctite 188-24205 to bottom shaft end screws and tighten simultaneously.
27. Reset position of round belt pulley and rollers and tighten. Reinstall top guide.
28. Attach Accumulator back onto Folder. Reinstall all covers.
29. Turn on power.



E.3 FOLDER

E.3a Description

Refer to the Fold Capacity Chart at the end of this manual.

Fed by the accumulator section, the folder is capable of placing 1 to 8 sheets in a C or Z configuration and up to12 sheets in a V fold (maximum of 24 panels in any configuration). Adjustable buckle plates set the distance of the fold from the edge of the paper. Fold rollers nip the paper as it is buckling, creating the fold. A 220VAC motor drives all folder shafts and rollers. The folder speed encoder, located on the infeed roller shaft, provides a folder speed signal.
Depending on the particular configuration, documents exit the folder in one of three ways:

1. Shingling conveyor stacker. The stacker allows easy continuous removal of document(s) while avoiding any loss of sequence.
2. Buffered transfer conveyor where nest folded documents are placed in an open station inserter track section.
3. Transfer conveyor where the nest folded documents are presented to the gripper arm.

E.3b Fold Principle

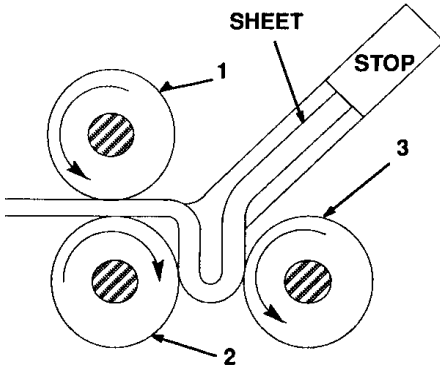
The folder works on the buckle fold principle using a fold plate and fold rollers.

Fold rollers 1 and 2 drive the sheet into the #1 fold plate until it comes up against the adjustable stop. The trailing edge of the sheet continues to be advanced by the roller and the sheet is buckled. The sheet is now pinched by fold rollers 2 and 3.

The rollers 2 and 3 pull the folded sheet out of the #1 fold plate while driving it to the next fold plate.

After the last fold, the sheet is transferred by the delivery rollers to the delivery belt on a delivery table or into the hopper or open station of an inserter by means of a transfer conveyor.

Note: The fold rollers are made of polyurethane and steel sectioned material. Clean using alcohol and a soft cloth.

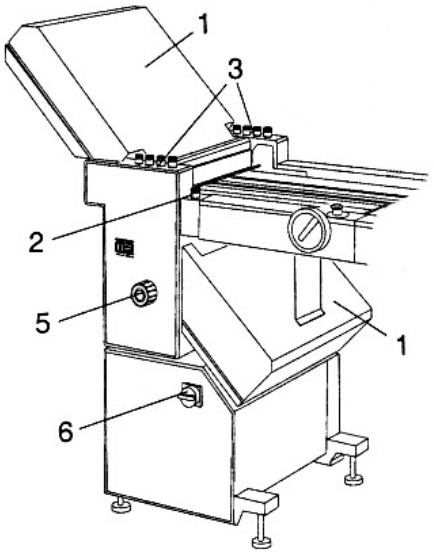


Fold Roller Diagram Figure

E.3c Components of the Fold Unit

Components and operating elements of the fold units:

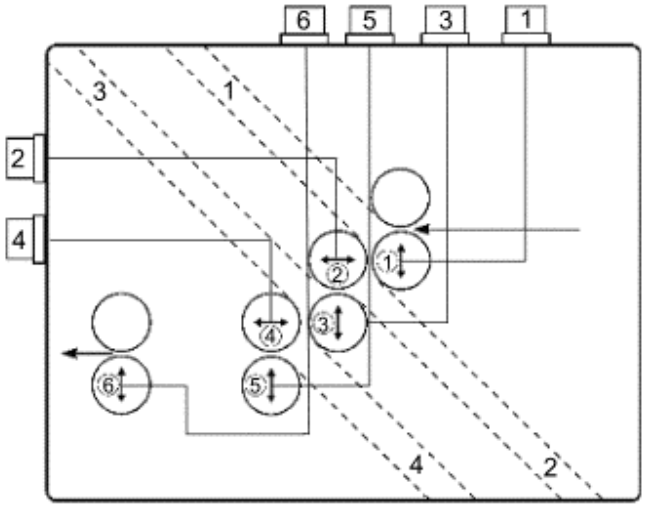
1. Noise covers
2. Paper thickness measuring device
3. Fold roller gap setting adjustment knobs
4. n/a
5. Handwheel
6. Folder power switch



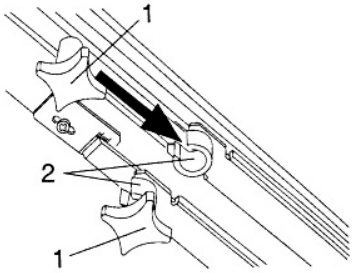
E.3d Fold Plate Positions

In the fold unit 38/4 there are four positions for the fold plates:

Fold Roller Diagram Figure

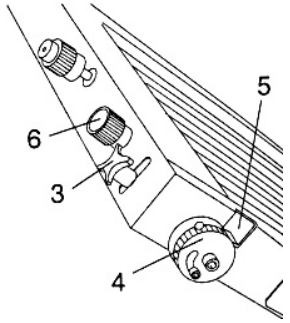


E.3e Position the Fold Plates and Deflectors



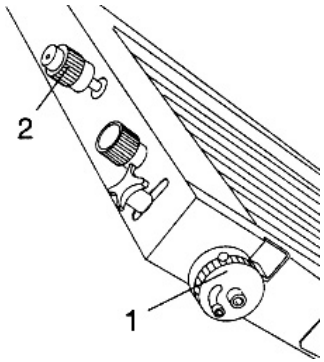
- The Fold plates and deflectors have a hand locking screw (1) each on the left-hand and right-hand side.
- Insert the fold plates and deflectors in such a way that the locking screws (1) fit in the recesses (2) in the frame of the fold unit.
- Secure the fold plates and deflectors by tightening the locking screws.

E.3f Setting the Fold Length on a MM 438



- Loosen the lock screw for the paper stop (3).
- Set the stop to the required position on the scale (5) by turning the adjustment wheel (4).
- Secure the fold plate stop by tightening the locking screw (3).
- By turning the fine adjustment screw (6), the fold length can be fine adjusted with the machine running.

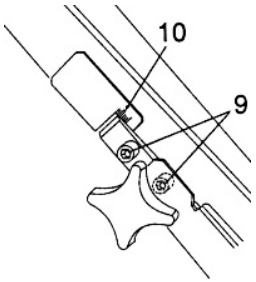
⇒ Adjustment by means of the fine adjustment screw is only possible when the lock screw for the fold plate stop has been tightened.



- By turning the knurled knobs of the adjustment wheel (1), it is possible to make angle corrections of the paper stop. For example; if the paper is out-of-square.
- The combination fold plate of a MM 438 has an infeed section with an adjustable lower lip. This means the space available to form the buckle can be modified depending on the thickness and the stiffness of the paper.
  The lower lip is moved by turning a fine adjustment screw (2) that is equipped with a scale.

Light paper grades: move the lip forward by turning the screw counter-clockwise.
Heavy paper grades: move the lip backward by turning the screw clockwise.

- For difficult-to-handle paper it is possible to set back the complete fold plate by up to 4 mm. For this, two allen screws (9) have to be loosened at the left and right side of the fold plate. A scale (10) facilitates precise setting.



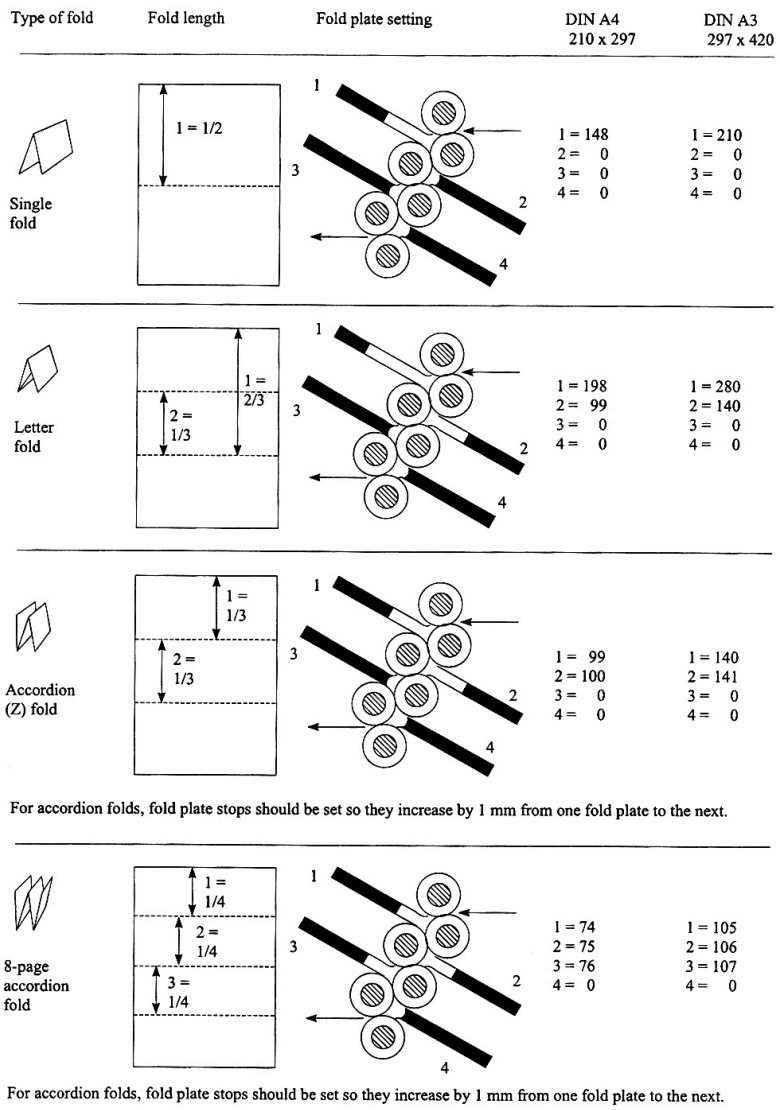
E.3g Close Fold Plate MM 438

If the fold plate is not used and must therefore be closed, it can stay in the fold unit.

- Set the fold plate stop to the maximum fold length (highest position) by turning the setting wheel (1).
- Continue turning the adjustment wheel against a slight resistance until the stop is reached; now the deflector has closed the opening to the fold plate.

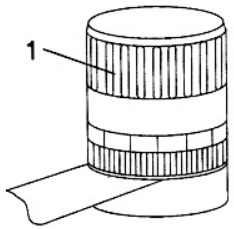
E.3h Setting the Fold Length

⇒The type of fold determines the position of the fold plates and deflectors.
The unfolded format determines the fold lengths to be set.
The fold length is the distance between paper stop and fold line.



Setting Guide for Common Types of Fold

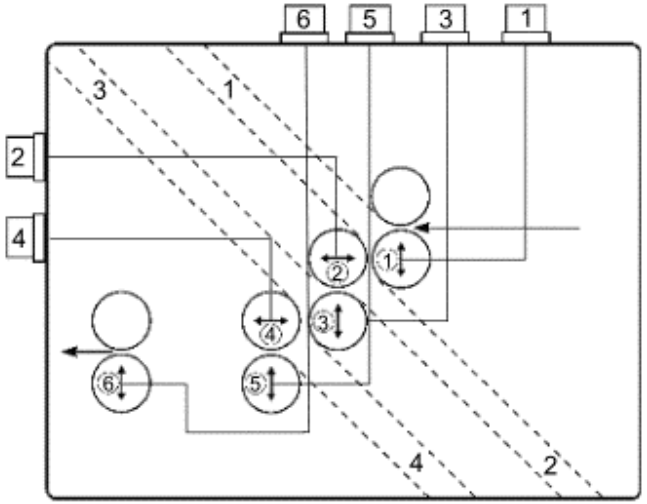
E.3i Setting the Fold Roller Gap



Each folder is equipped with a paper thickness caliper (1).
Before setting the fold roller gap, clamp the respective paper between the rollers and read the paper thickness of the scale.
The fold roller gap is set by means of setting screws which are numbered.

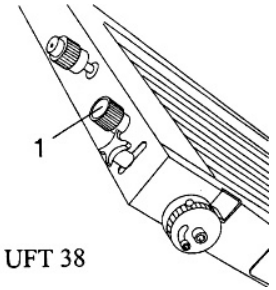
Roller 1	is the	**infeed roller**
Roller 2	makes the	**1st fold**
Roller 3	makes the	**2nd fold**
Roller 4	makes the	**3rd fold**
Roller 5	makes the	**4th fold**
Roller 6	is the ejector roller	

The basic principle of buckle plate folding has to be considered when choosing the correct setting of the fold rollers.
There are two different types of fold:
Folds with **always symmetrical** panels.
Folds with **partly asymmetrical** panels.



Folds with *always symmetrical* panels:
If the panels of a folded sheet always have the same length when passing through the fold rollers, the gap to be set for the respective fold roller depends on the number of paper layers which have left the preceding fold plate.
Folds with *partly asymmetrical* panels:
If the panels of a folded sheet are of **unequal** length when passing through the fold rollers (accordian fold, letter fold in fold plates 1 and 2), the gap to be set is governed by the number of paper layers contained on the longer panel.

E.3j Fine Adjustments and Corrections



Fold Length

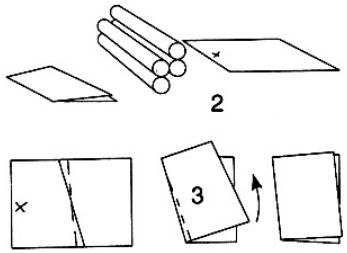
Fold variations may occur if the fold plate stops are not set accurately of if the folding speed is changed. The fold is off across the whole width of the sheets (as opposed to a skewed fold). Corrections of the fold length are made by turning the fine adjustment knob (1).

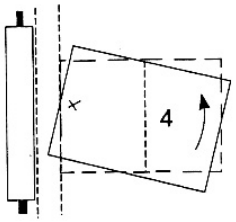
⇒A change in the folding speed also changes the fold length. Therefore the set-up speed must be maintained.

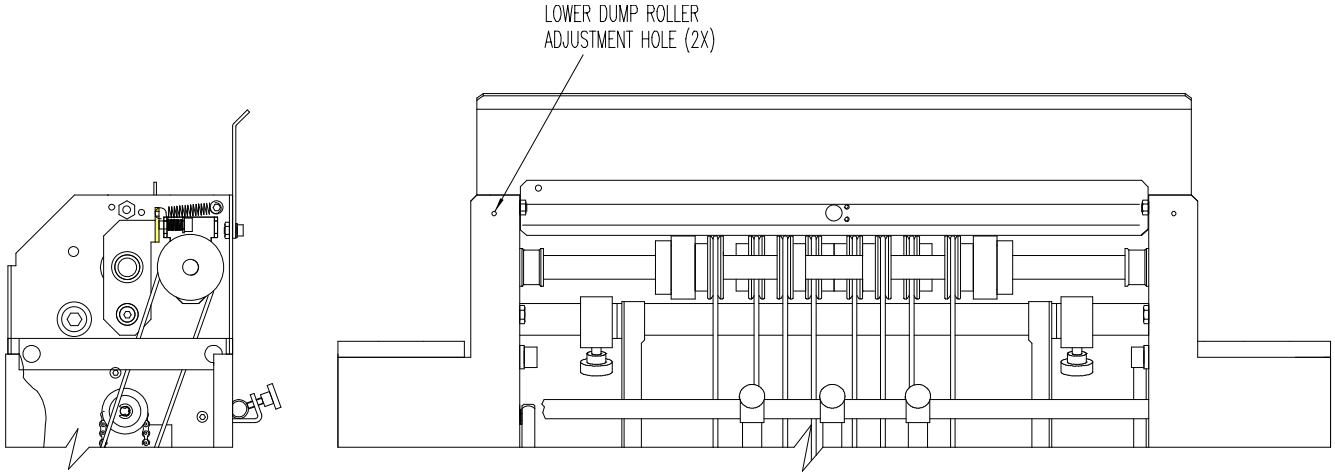
Skewed Folds

Skewed (out-of-square) folds occur when the paper is not fed at the right angles with respect to the fold rollers. This can be corrected as follows:

- Mark the leading edge of a sheet and feed it through the fold unit (2).
- To make the deviation more obvious, exaggerate the skewed fold by hand (3).
- Open the folded sheet and place it in front of the roller infeed section (4).
- Adjust lower dump rollers on exit end of accumulator through hole indicated.







Out-Of-Square Paper

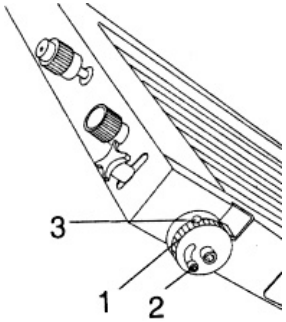
If the paper is not cut exactly at right angles, the folded sheet may show “points”. By turning a setting screw, the fold plate stop can be made parallel to the out-of-square paper.

Note: Make this correction only on the first fold plate.

Correction on Combination Fold Plate MM 438:

It is possible to change the parallelism of the stop by turning the knurled knob (1).

- Loosen the knurled knob by means of a 4-mm allen key (2). The angle of the stop is changed by turning the two knurled knobs. The stop is parallel to the fold rollers when the two half-round marks (3) face each other.



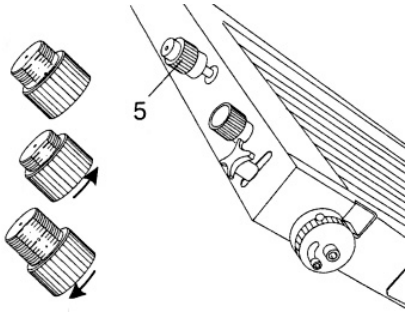
Shadow Fold (MM 438)

The lower lip can be adjusted by setting knob (5).

Basic position:
“0” is flush with the top of the knob.

Lower lip advanced:
Small buckle space, setting knob “-“.

Lower lip set back:
Large buckle space, setting knob “+”.

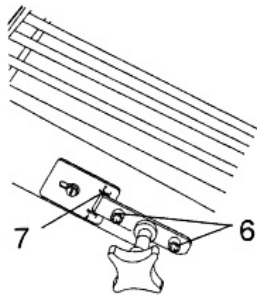


- Thin paper grades: Advance lower lip, “-“.
- Heavy paper grades: Set back lower lip, “+”.

Accordion Fold

It is possible that heavy paper grades get stuck and form a so-called “accordion fold”. In such a case the fold plates must be set back.

- Loosen the allen screws (6) both sides of the fold plate.
- Set back the fold plate using the scale (7).
- Tighten the allen screws.
- Change the fold stop plate by the same amount.



Creasing:

When special types of paper are folded, deviations from the nominal values may become necessary.

Individual corrections can be made by means of the numbered setting knobs at each roller.

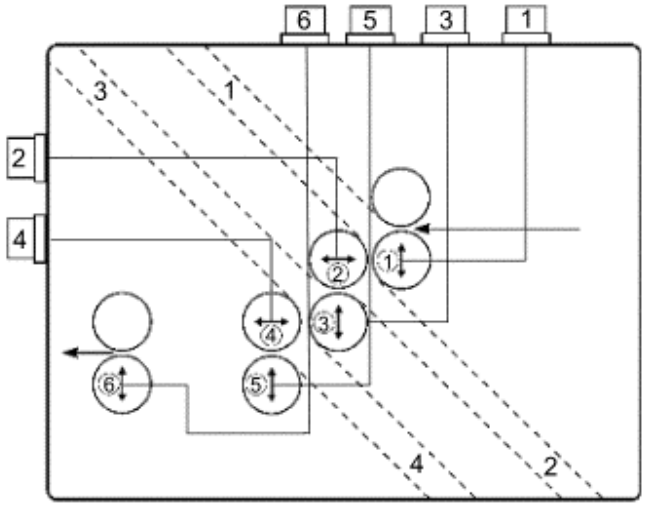
The fold rollers and delivery shafts with the matching setting knobs are arranged according to the following scheme:

Roller 1	is the	**infeed roller**
Roller 2	makes the	**1st fold**
Roller 3	makes the	**2nd fold**
Roller 4	makes the	**3rd fold**
Roller 5	makes the	**4th fold**
Roller 6	is the ejector roller	

⇒The setting knobs are equipped with scales (1). With their help settings with a precision of 0.1 mm are possible.

An additional scale (2) indicates adjustments of 0.5 mm.

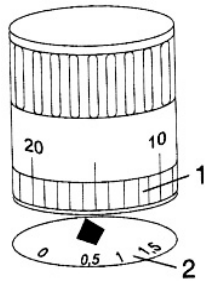
One turn of the setting knob changes the roller gap by 0.5mm.

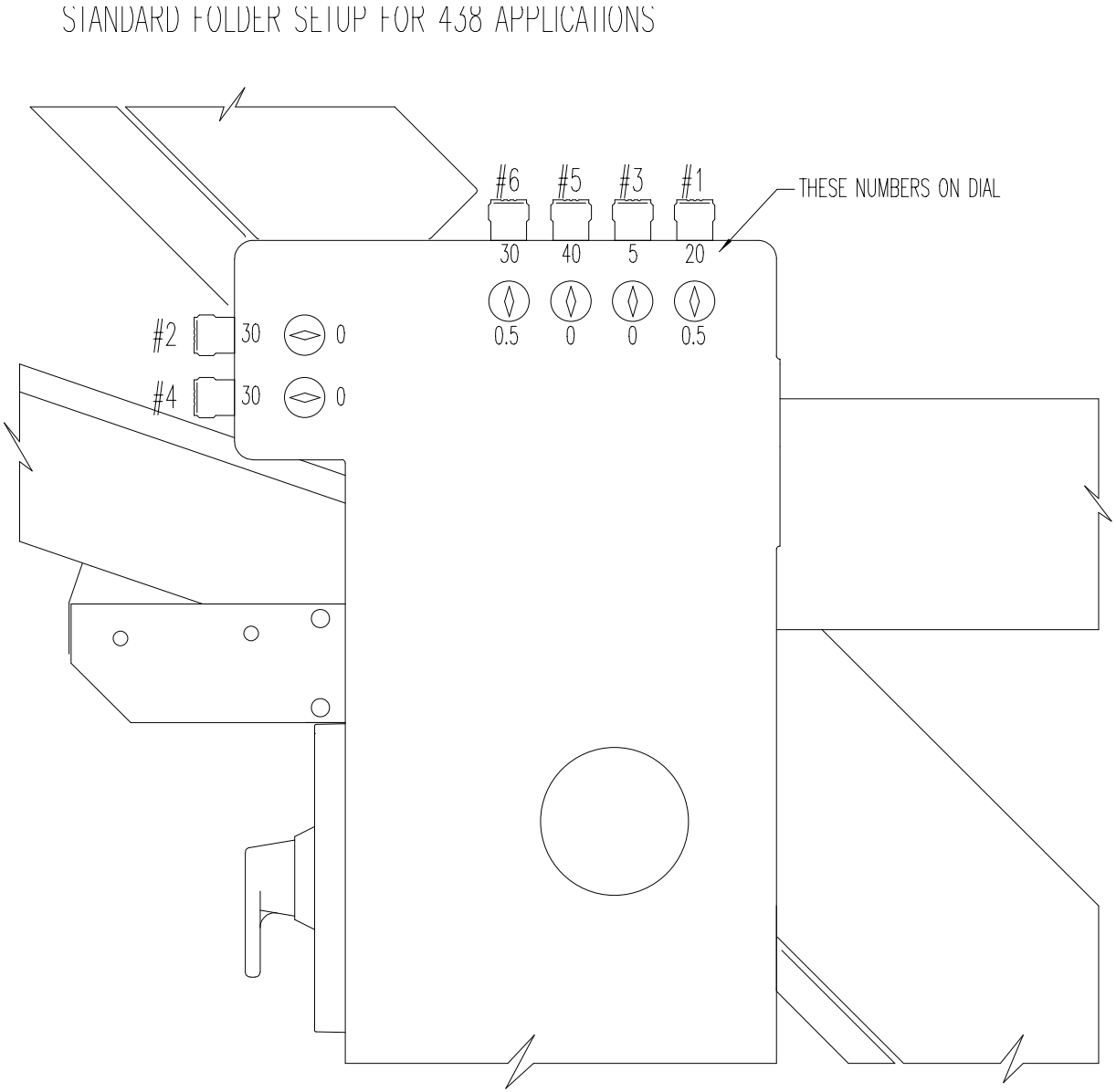


To increase the roller gap, turn the setting knob counter-clockwise.

When the roller gap is changed by more than 0.5mm, the values on both scales must be added.

Example: 0.5 (2) + .16 (1) = 0.66 mm





Standard 438 Folder Knob Setup

FOLDER JAM

Analysis
When a pack exits the accumulator but isn't detected by the input sensor in the transfer conveyor (station one), an error is generated and the machine stops. This prevents damage to the folder. The amount of time allowed is set in Engineering Values "08 Xcvy Into Station 1 Time".

This applies to a straight conveyor as well with the exceptions that the exit sensor on the folder is used instead of the transfer conveyor and the time allowed is set in Eng Values "04 Folder Exit Time".

A counter feature also keeps track of the number of packs in the folder. When a pack leaves the accumulator, it is incremented by 1. When a pack reaches the input sensor of the transfer conveyor or the exit sensor of the folder when a straight conveyor is used, the count is decremented by 1. If this count reaches 3, a folder jam is declared.

Initial Action
Check sensors
Check engineering values (refer to section H, "Engineering Values")

E.4 TRANSFER CONVEYOR

E.4a Description

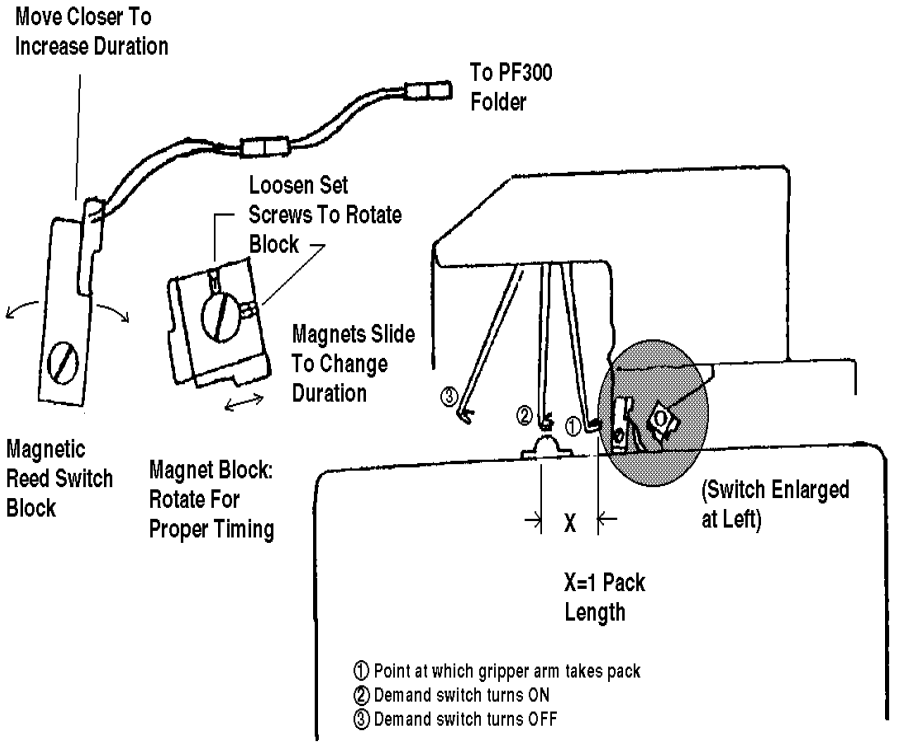
The transfer conveyor is an articulated belt system which presents the nest folded document(s) to the Inserter gripper arm.

E.4b Timing

Demand switch on/off timing is critical. The setup of this timing permits the 438 to achieve optimal handoff to the Inserter.

The demand switch should be made, (contacts closed), when the gripper arm is approximately perpendicular to the deck of the Inserter. This point occurs twice each 360 degree cycle of the inserter. With the gripper arm fully into the insert station the inserter is said to be at zero or “home” position. During a single cycle of the inserter the gripper arm, starting in this position, will move toward the track. When the arm becomes perpendicular to the deck it is at the first perpendicular point. The gripper arm continues to move out away from the track and reverses direction. The inserter is now 180 degrees in its’ cycle. With the gripper arm continuing to return toward the insert hopper it will again come to a position perpendicular to the deck. This is the correct point to have the demand switch send a signal to the GBR. There is a large window of opportunity here that is about 110 degrees wide. A signal from the demand switch within the window will tell the GBR it is time to place a package in the track, and this can be adjusted by rotating the demand block for optimum performance.

This timing setup is also used to adjust dwell time for the “Open Feed” option.


Move Closer To Increase Duration
To PF300 Folder
Loosen Set Screws To Rotate Block
Magnets Slide To Change Duration
Magnetic Reed Switch Block
Magnet Block: Rotate For Proper Timing
(Switch Enlarged at Left)
X
X=1 Pack Length
① Point at which gripper arm takes pack
② Demand switch turns ON
③ Demand switch turns OFF

Transfer Conveyor Demand Switch Figure

E.4c Exit Sensor Test on the Transfer conveyor

The exit sensor on a 438 creates an interrupt to the control card. This interrupt permits accurate positioning of packages on the transfer conveyor. Testing the interrupt communication is done in the following manner:

1. Clear transfer conveyor of all documents

2. Place a folded document approximately 1/2 inches before the Exit sensor on the transfer conveyor.

NOTE: Be sure the inserter is running to supply a demand signal.

3. Run the 438 and command the machine to dump.

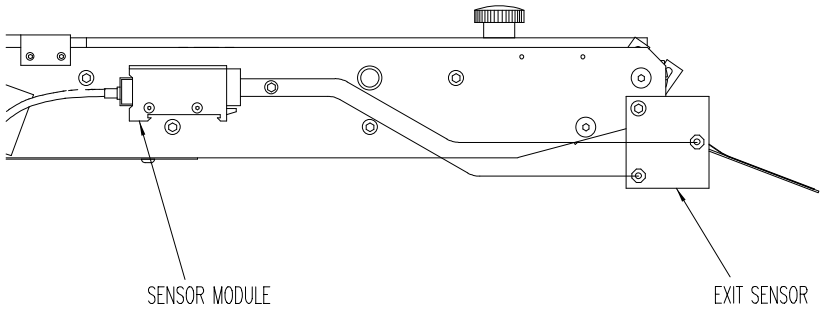
4. The Transfer conveyor will index in response to the dump command. If the package that was placed just before the exit sensor stops at the discharge end of the Transfer conveyor the interrupt is being seen by the control card. However if the document is passed out of the end of the transfer conveyor then the interrupt is not being seen by the control card.

NOTE: See opto 1C3D4: Interrupt signal

E.4d 438 Configuration of Exit Sensor Module

The Exit sensor amplifier module on the transfer conveyor has an “active state” selection switch on it. This switch can be set to LIGHT ON or LIGHT OFF. The proper position for the switch is LIGHT ON.

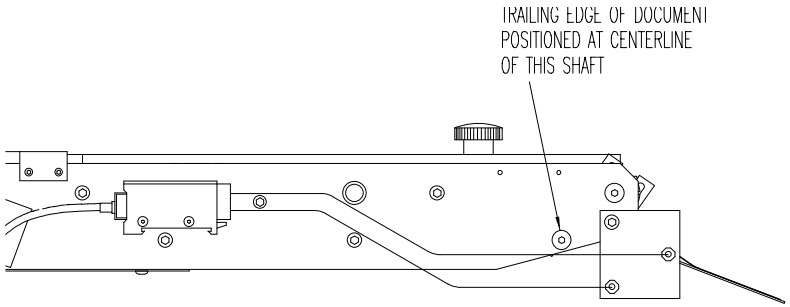
Transfer Conveyor Exit Sensor Figure



E.4e Package Overhang at insert Station

When a package is being presented to the gripper arm (furthest station from the stuffing station) the package should have only the trailing edge of the folded document held by the flat green belts. Positioning the trailing edge of the document at the centerline of the lower, forward-most shaft provides the desired document position.

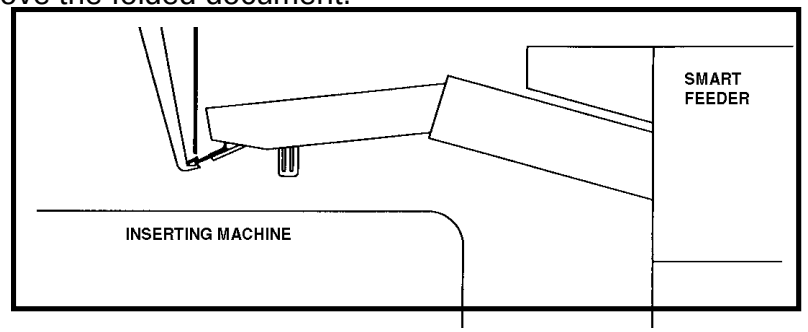
When the gripper arm removes a package from the transfer conveyor, the flat green belts of the Transfer conveyor will creep if more than 3/4 of inch of the package is being pinched by the flat green belts. The creeping of the flat green belts will cause the packages to become improperly gapped in the transfer conveyor.

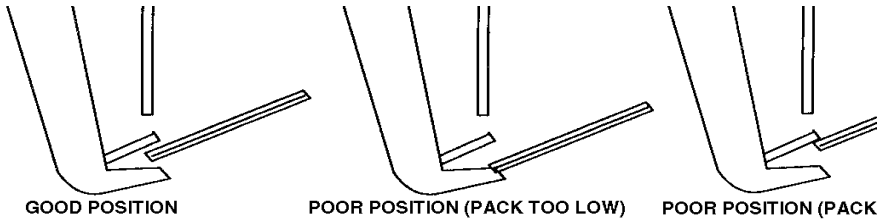


Transfer Conveyor Figure

E.4f Transfer Conveyor's Outfeed Guides Position

It is recommended that the transfer conveyor arm be positioned parallel to the deck of the inserter and it should be close enough to the deck so the outfeed guides do not need to drastically deflect the folded document. This will help prevent the flat green belts from creeping and ease the extraction force required to remove the folded document.





E.4g Fold Quality

Consistent fold size is required to prevent the package size position from varying too much. It is important that the packages in the transfer conveyor do not vary so as to throw off the timing of the ejection.

E.4h Transfer Conveyor Package Spacing Problem

If a package spacing problem occurs in the transfer conveyor, it should be purged of all the remaining documents in it. This will reset the package positioning.